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THE ROLE OF CSIR IN THE
NATIONAL PROGRESS THROUGH
THE REGIONAL DEVELOPMENT

A REPORT

REGIONAL RESEARCH LABORATORY,
HYDERABAD-9

THE ROLE OF CSIR IN THE
NATIONAL PROGRESS THROUGH
THE REGIONAL DEVELOPMENT

THE REPORT
OF A COMMITTEE APPOINTED
BY DGSIR

Hyderabad
April, 1974

THE HOUSE OF REPRESENTATIVES
COMMITTEE ON THE SELECT COMMITTEE
ON THE HOUSE OF REPRESENTATIVES

THE REPORT
OF A COMMITTEE APPOINTED
BY HOUSE

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REPORT
OF THE

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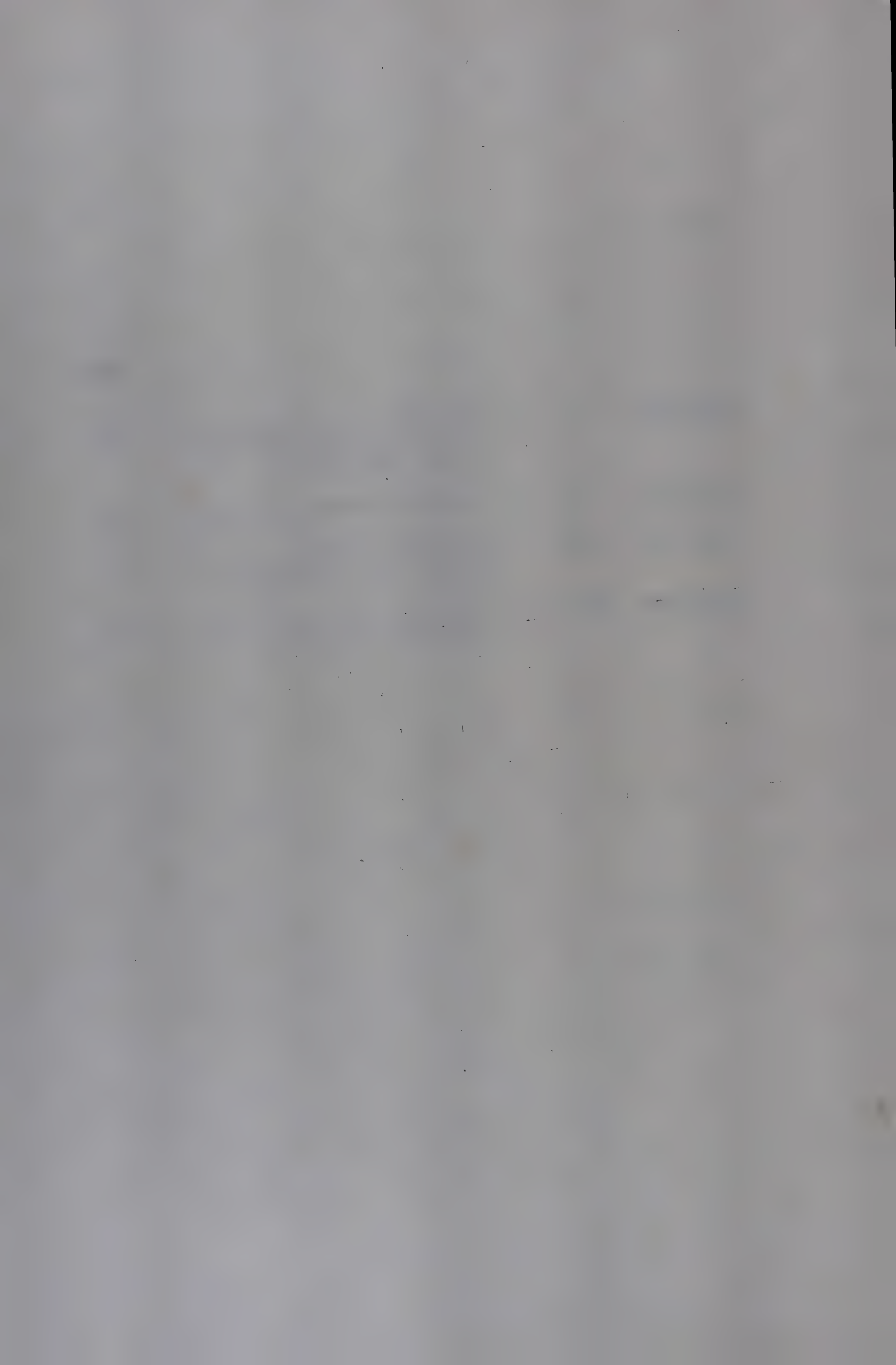
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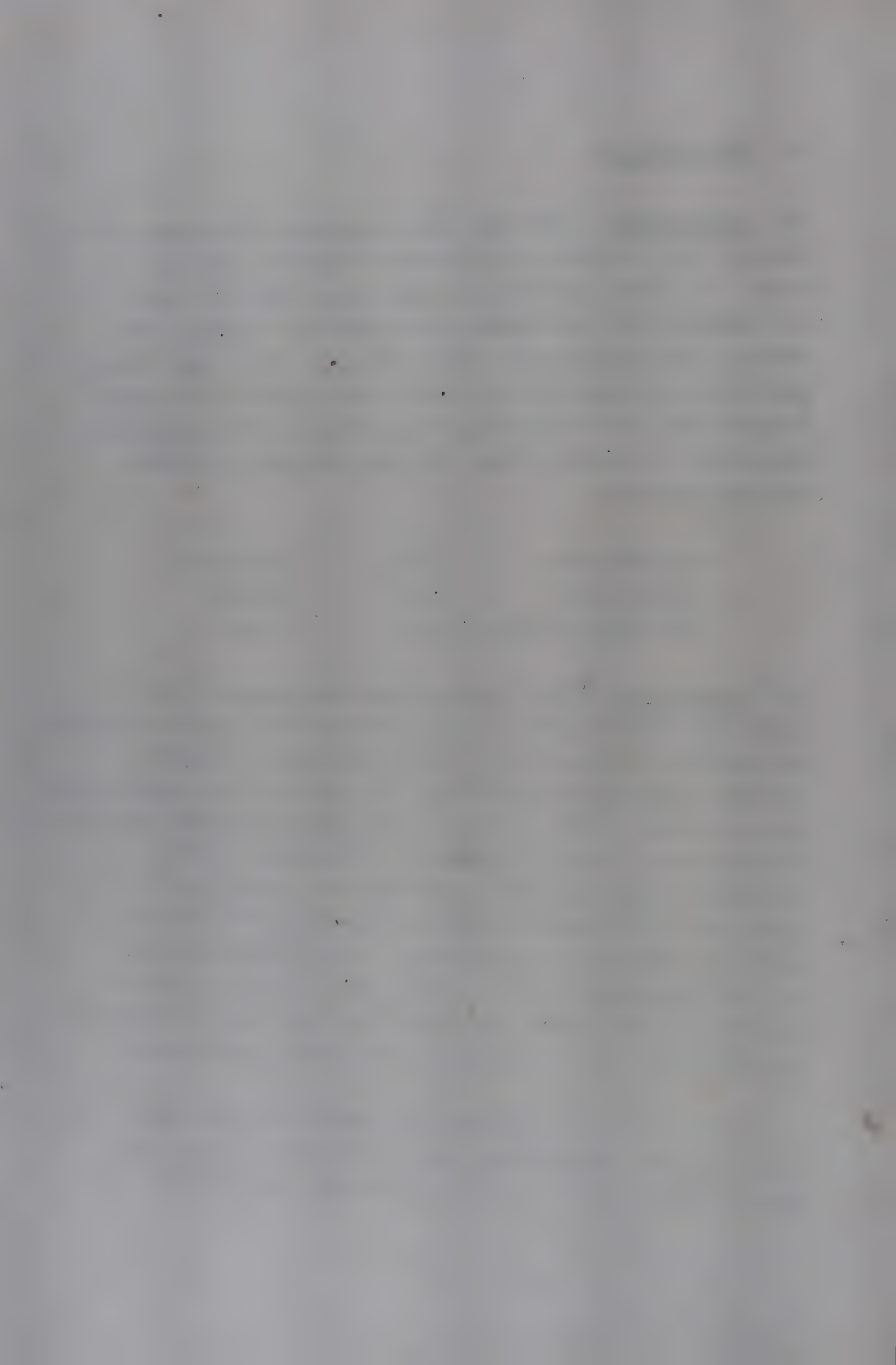
1. INTRODUCTION

1.1 Assignment: CSIR has been receiving, from time to time, requests to set up R & D Centres in various States. In some cases, the State governments have also indicated their willingness to financially participate in capital and revenue expenditure when these centres are set up. DGSIR, therefore, through his D.O.letter No.DG(PS)/73-354 dated February 23, 1973 (Appendix I) constituted the following Committee to examine these requests and make suitable recommendations:

Dr.G.S.Sidhu	...	Chairman
Dr.B.L.Amla	...	Member
Shri Bharat Bhushan	...	-do-

1.2 Framework: While giving this assignment to the Committee, DGSIR made it clear that "CSIR is not interested in setting up RRLs on the pattern obtained earlier". Amongst suggestions by him was "to decide as to organisation and structure of the type of Unit CSIR propose to put up". It could be a "simple technical information centre, extension centre or a multi-laboratory CSIR Complex or a design and development centre or a mixture of these." It should be flexible and it should be multidisciplinary and the important thing of it is that such a structure should meet the needs and demands of the State and would be answerable to the technological tasks agreed upon.

He further suggested "to arrange in the very beginning for involvement and commitment of the State and the industry to be associated with CSIR set-up. It



would be 50% of the total expenditure and recurring expenditure in the States which could afford. It may be much less in other States. There is no fixed pattern for this".

1.3 Guidelines: The Chairmen of Inter-laboratory Coordination Councils at their meeting of March 18, 1972 laid down guidelines for setting up new Regional Research Laboratories/ Regional and Extension Centres of Specialised Laboratories including Information Centres, Polytechnological Clinics and Design and Development Centres. The guidelines were approved by the Vice-President, CSIR and conveyed to the Committee by Scientist-in-Charge, RCIL Division, CSIR through his D.O.Letter No.8/2/72-L dated February 26, 1973. (Appendix II).

1.4 Consultations with CSIR HQ: The steps necessary to initiate work on the above assignment were discussed at meeting held on April 4, 1973 at CSIR HQ and attended by Secretary, CSIR, Scientists-in-Charge, RCIL and RSPD, Dr.G.S.Sidhu and Dr.B.L.Amla. The following decisions were arrived at:

The CSIR will send Dr.G.S.Sidhu, Shri Bharat Bhushan and Dr.B.L.Amla

- (i) the pending requests from various States and
- (ii) a list of existing zonal centres or any other type of extension centres of CSIR laboratories in various States.

Secretary, CSIR will write a letter to all the States from where requests are pending that the

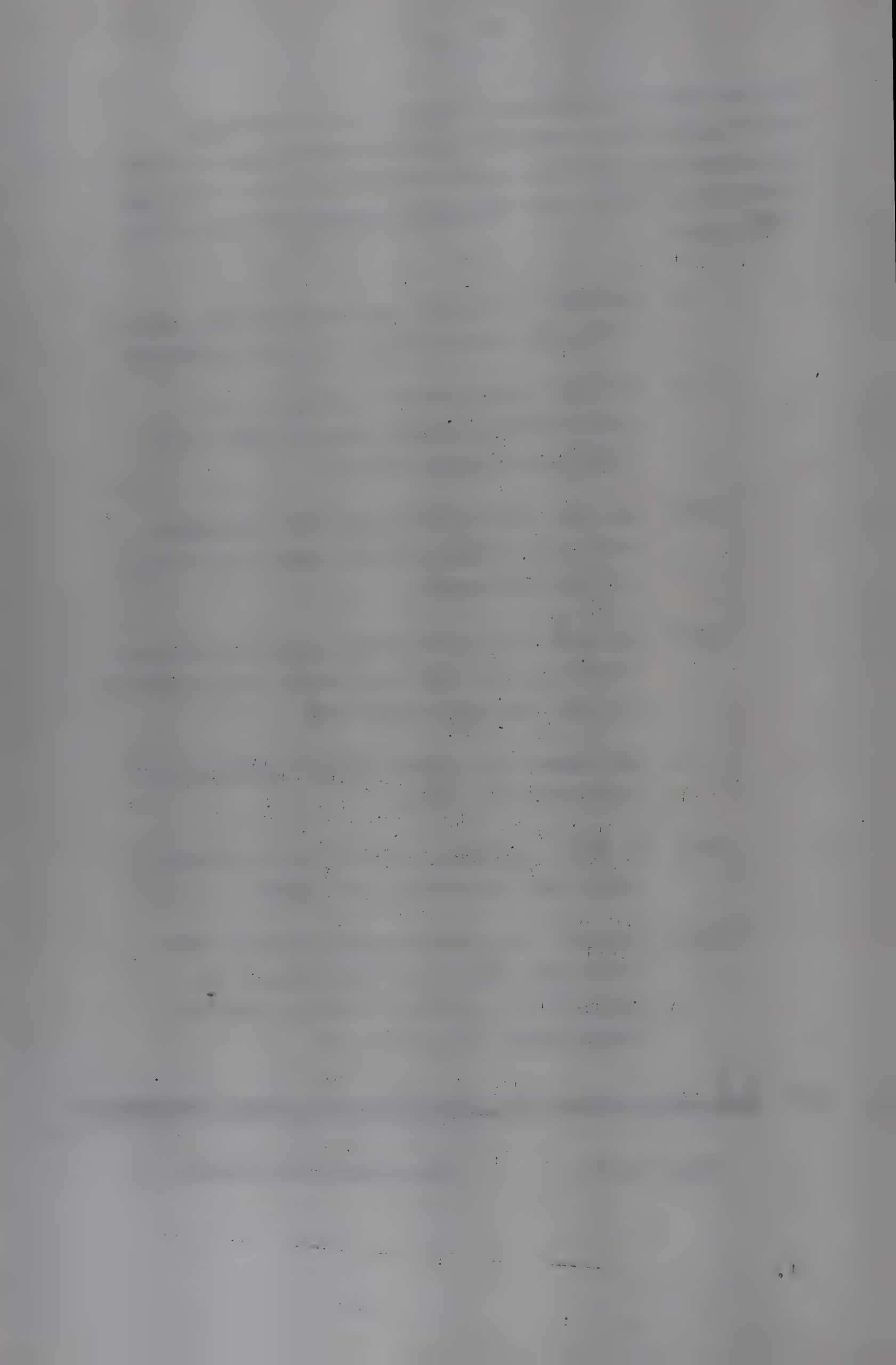
Director-General has appointed a Committee of Dr.G.S.Sidhu, Dr.B.L.Amla and Shri Bharat Bhushan to study these requests and make recommendations.

This letter will also request the States to send Dr.Sidhu and Dr.Amla

- (i) the copies of their draft Fifth Five Year Plan
- (ii) copies of NCAER Survey Reports about the resources of the State, if available
- (iii) other reports prepared by State Agencies on the resources of the States
- (iv) the existing research and development, analytical and technological facilities by way of Colleges of Engineering, Small Industries Services Institutes, Polytechnics etc., that may be located in the State
- (v) the list of existing industries in the State and
- (vi) any proposals formulated by the Director of Industries or other authorities of the State for setting up R & D Institute

Dr.Sidhu will then organise the analysis of these data and visit to the States and work on preparation of the reports to be able to arrive at concrete agreed proposals between the States and the CSIR.

During discussions with the Scientists at CSIR, HQ, it was brought out that though a study of working



Potentialities of Districts
(District-wise);

Small Scale Industry Area Surveys
(Selected areas);

A document on analytical and
testing facilities available in
the State and a schedule of
charges (Appendix III);

State's request for setting up
a CLRI Extension Centre
(Appendix IV).

Gujarat: Industrial Programme for the
IV Plan (NCAER).

Punjab: Approach to Fifth Five Year
Plan for Development of
Industries in Punjab;

State's request for setting
up of a Regional Testing and
Development Laboratory
(Appendix XII).

Kerala: No documents received; a report
of discussions between Shri Baldev
Singh and the Officers of the
Industries Department, Government
of Kerala (June, 1973)(Appendix V)
and a resume of DGSIR's recent

discussions with CM and Officials of Kerala Government were, however, available to the Committee.

Madhya Pradesh:

No documents received; a copy of the State's plan to set up an R & D Centre was available at RRLH (Appendix VI).

The information on hand was too meagre to enable an analysis and thus could not be used as a guideline for evolving a regional or a national pattern of R & D requirement. It was also felt that the State development plans often times include items arising out of non-technological considerations. It is therefore, not feasible to integrate R & D needs at this stage without a detailed study. It is, however, possible to have an overview and suggest measures to fill the known gaps. The Committee has adopted this approach.

1.6 Development gaps: It is generally recognised that there are several gaps between R & D and its applications which retard the progress of a project all along the innovation chain. However, only those which specifically concern the regional development are mentioned here.

Communication links: The lack of sufficient and viable communication and information links with the State governments and its developmental agencies and to some extent with industry, especially of the small scale sector is a known lacuna. The charters of the national laboratories located in different States do not mention

(with the exception of RRLs and the Complex) even an intention to establish any rapport with the concerned State. Thus due to lack of effective communication, the State governments have to some extent been unable to appreciate the role and purpose of different R & D setups of CSIR and other similar agencies. It is therefore not surprising that several State governments wish to have R & D laboratories modelled after the existing RRLs to whom they could refer all their R & D problems for solution. It is not realised that as the development of a State is in several fields like industry (chemical, food, leather, ceramics, metallurgy, engineering, etc.), roads, housing, public health, agriculture, resources survey, etc., it is not possible for a single laboratory, however large and well-equipped, to handle all these fields.

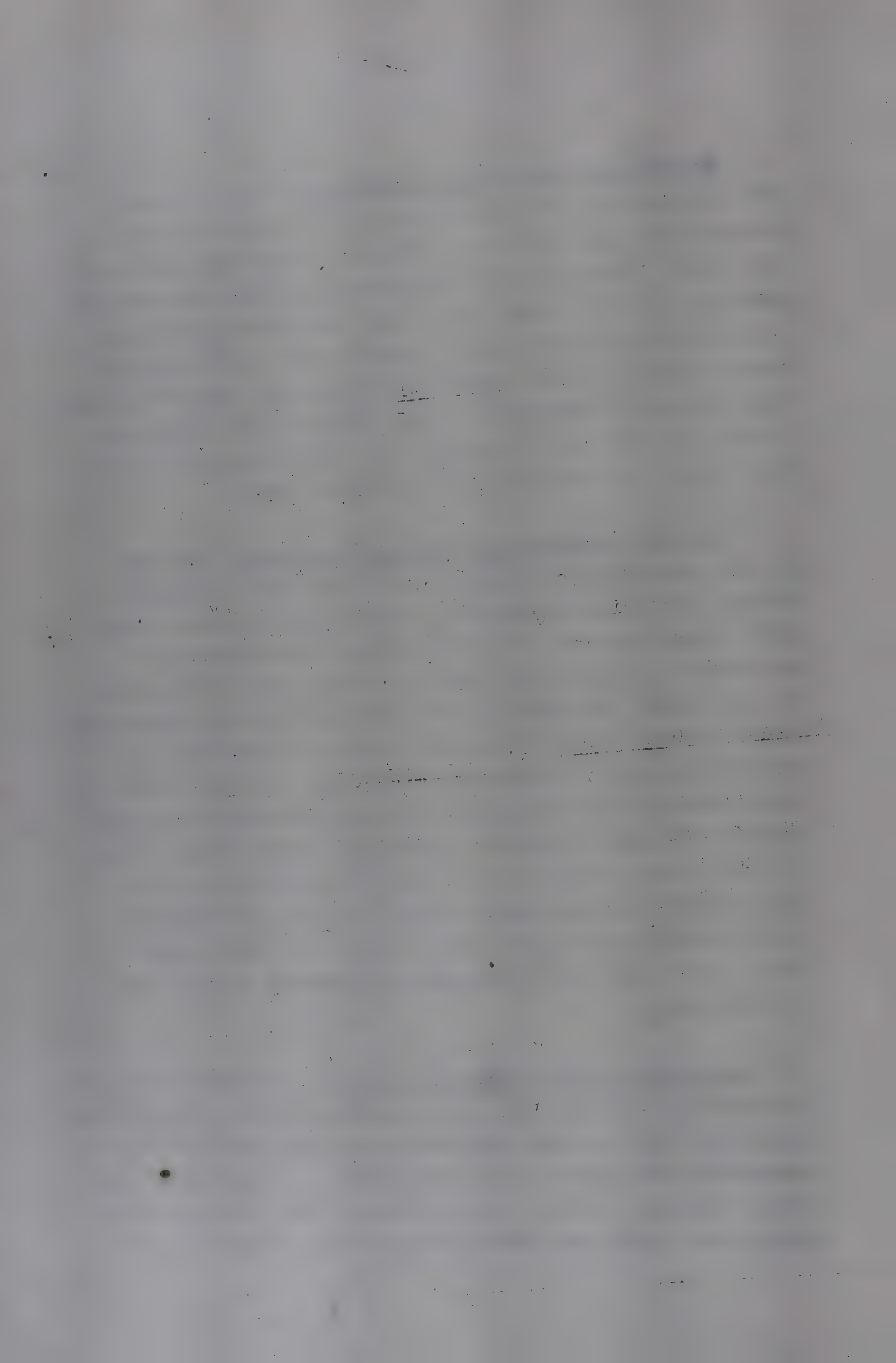
Upscaling and downscaling facilities: The Gujarat Government has established some pilot plant facility in an industrial estate in Baroda where qualified scientists and engineers can rent the equipment for upscaling a laboratory process either worked by them or taken from literature. Similarly, many technologists who have worked on large scale plants can use these pilot equipments for downscaling experiments. The Committee was informed that some new ventures have come up in Gujarat as a result of this facility. RRLH and some other national laboratories also permit the use of its pilot plant equipment to the qualified technologists for such purpose. Such an item has also been included in M.P. Government's proposal to set up an R & D centre under the title Intermediate Technology.



Design and engineering facilities: The design and engineering assistance is a well-recognised gap. Several attempts have been and are being made to bridge this gap. Public sector organisations like EIL and EPI generally handle large projects. Several engineering consultancy companies have recently come up in private sector but are often beyond the reach of a small investor. This has been recognised by the NCST and the Planning Commission and some proposals are likely to take shape as a result of emphasis laid in the V Plan.

General technical consultancy service: Industry or the government sometimes desire general technical advise on a new project they wish to undertake or they wish their expansion or diversification plans to be critically examined or they may simply want collection of published information on a given problem or technology. Many national laboratories do undertake this type of work on payment or otherwise depending upon the merits of each request and the quantum of work involved, and some laboratories have separate technical consultancy cells. In most cases, however, it receives lower priority as compared to project-work in which the scientists are intellectually and emotionally involved. This does result in delays and consequent resentment on the part of consultee.

Analytical and testing facilities: Several national laboratories and all extension centres provide specialised analytical and testing facilities on commercial basis. Commercial analysis is also undertaken by Government Test House and some private laboratories. Many State governments have their own testing facilities, especially for



civil engineering materials, public health and soil analysis. Rajasthan Government has coordinated the testing activity spread over government departments and the universities. and prepare a common schedule of charges (Appendix III). But small industries and traders are usually unable to make use of these facilities due to distant location of the testing centre, long delays in getting test reports due to work load or even ignorance of the existence of these facilities.

R & D gaps: There are several fields of research and development which are not represented or insufficiently represented on the R & D map of India. Many of these are identified and are included in the V Plan of the CSIR. (Fifth Five Year Plan of the CSIR, June 1973, pp. 101-105). An area of R & D which has received added significance recently is the development of new sources of energy (comments on Fifth Five Year Plan by RSPD, March 1973, pp. 48-49). It is not in the purview of this Committee to comment on or make suggestions with regard to locational and other aspects of these proposal, but a passing reference will, however, be made where appropriate.

Integration and projection of the regional needs into R & D: This is an important aspect which could be best coordinated by a cell at the CSIR, HQ. Inputs would be provided by the national laboratories and the proposed polytechnological clinics located in different states of the country. After evaluation and integration, the proposed cell will provide feed back for projection in the R & D programmes of the specialised laboratories and their extension centres.

1.7 The approach: The general approach of the Committee has been to suggest a plan for gearing up of the existing and the projected R & D set up, particularly of the CSIR, towards national progress through the regional development and to recommend supplementary and complementary measures which not only cater for the needs of the States but also fit into the pattern of national goals. In making its recommendations, the Committee has always kept its focus on the ultimate beneficiary - the user.

2. R & D SET UP IN INDIA

2.1 Universities: Research facilities exist in all the universities which are located in different parts of the country. With some notable exceptions of some technological departments, IIT, Agricultural Universities, there is yet no tradition of industry or the government sponsoring work in these institutions. This infrastructure which is spread all over the country is, therefore, almost totally utilised for carrying out fundamental work and hardly any applied research is undertaken. The number of these institutions is given below:

Universities	..	79
Institutes deemed as Universities	..	10
IITs	..	5
Advanced Research Training Centres	..	17

2.2 Research and development organisations: Several government financial organisations operate in the country. These are CSIR, ICMR, ICAR, ISRO, RDSO (Ry), DAE and DRDO. In addition, there are in-house research and development centres of industry, both private and public sector. CSIR, apart from establishing Extension and R & D Centres of specialised laboratories in different parts of the country, finances several cooperative research associations of industry. A break-up of these R & D institutions is given below:

CSIR	..	37 (including Museums and INSDOC)
Cooperative R & D Associations	..	13
ICMR	..	14
ICAR	..	37
DRDO	..	32
DAE	..	NA
ISRO	..	NA
RDSO (Ry)	..	2(+ 6 Inspection Centres)
Private industry	..	40
Public sector	..	18
Independent	..	14

Recently, a fillip has been given to establishing more in-house R & D facilities. For example, BHEL (Hyderabad), Instruments Designs (Kota), IPCL (Baroda), HPF (Ooty) and Ordnance Factories have all set up their R & D centres. Similarly, in private sector, Hoechst (at Mulund), Themis (at Vapi), Bajaj Tempo (at Bombay), Kirloskars (at Poona), JK Synthetics (at Kota), Larsen and Toubro (at Bombay), SK & F (at Bangalore), Ranbaxy (at New Delhi) and Union Carbide's Pesticides Division (at Bhopal) have also established R & D centres. Cement Research Institute of India (a CSIR-aided Cooperative Research Association) have plans to set up a Regional Centre in Tamil Nadu. Like-wise, another Cooperative Research Association - Rubber Research Institute propose to set up Regional Stations in Karnataka, Tripura, Andaman Nicobar Islands and at Kanyakumari.

2.3 R & D set-up of CSIR: The constituent units of the CSIR cater for diverse fields of R & D. These may be broadly categorised as:

Examples

discipline-oriented	..	NCL, NPL, CECRI, etc.
commodity-oriented	..	CLRI, CGCRI, CFTRI, etc.
multi-disciplinary and raw material oriented	..	RRLs, CSIR Complex
cooperative associations	..	SASMIRA, ATIRA, SITRA, etc.
technical information, science awareness and education	..	INSDOC, PID, Museums, TICCI, etc.
extension work	..	Zonal, Extension and Field Centres of different laboratories

National Laboratories or their Extension Centres are located in all the States of India, with the exception of Arunachal Pradesh, Andaman and Nicobar Islands (CRRI is now planning to set up an Experimental Station here), Haryana, Himachal Pradesh, Manipur, Meghalaya, Nagaland, Laccadive group of islands, Mizoram, Pondicherry and Tripura. Set up of CSIR in other areas is given in Table 1.

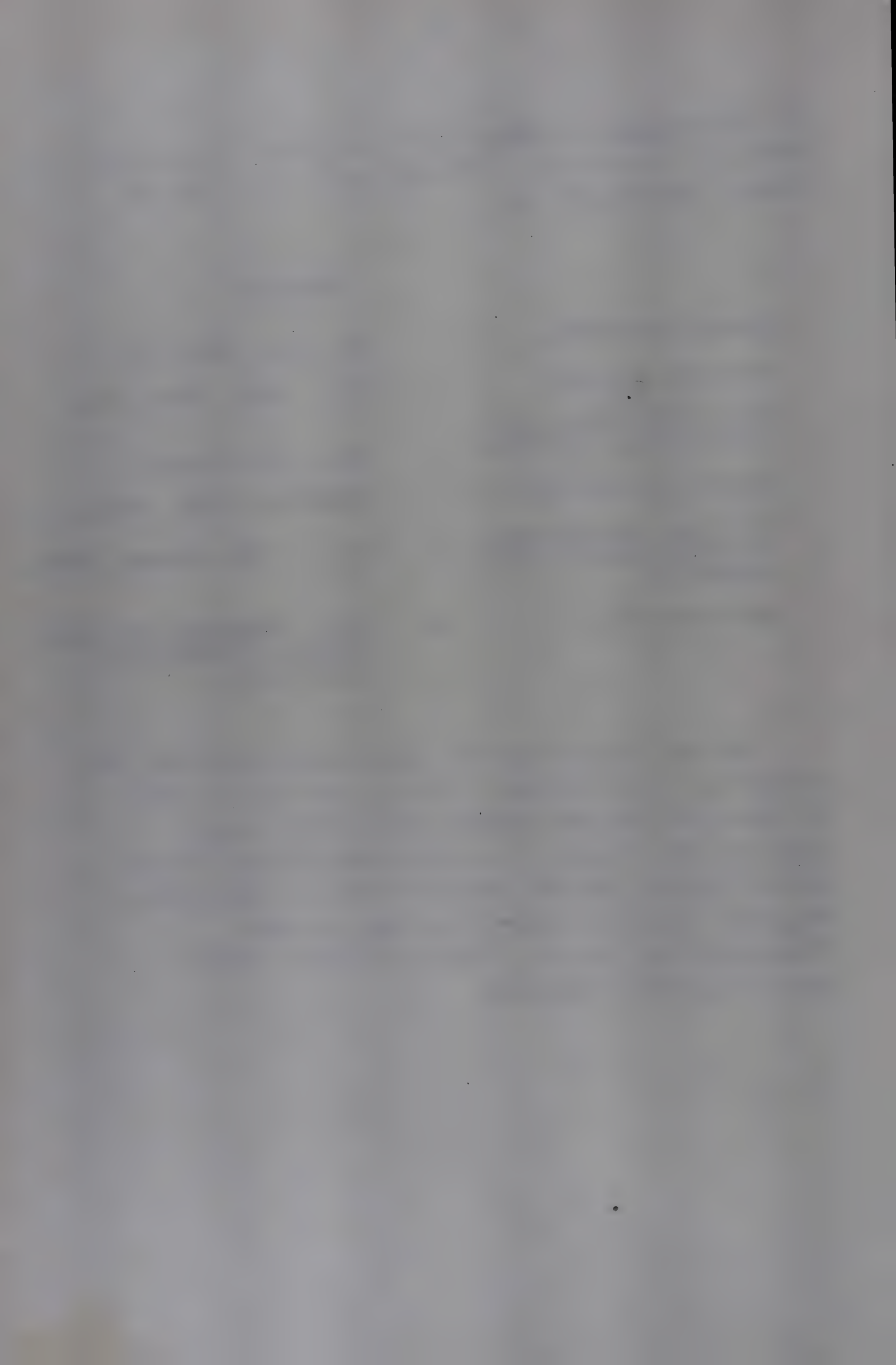
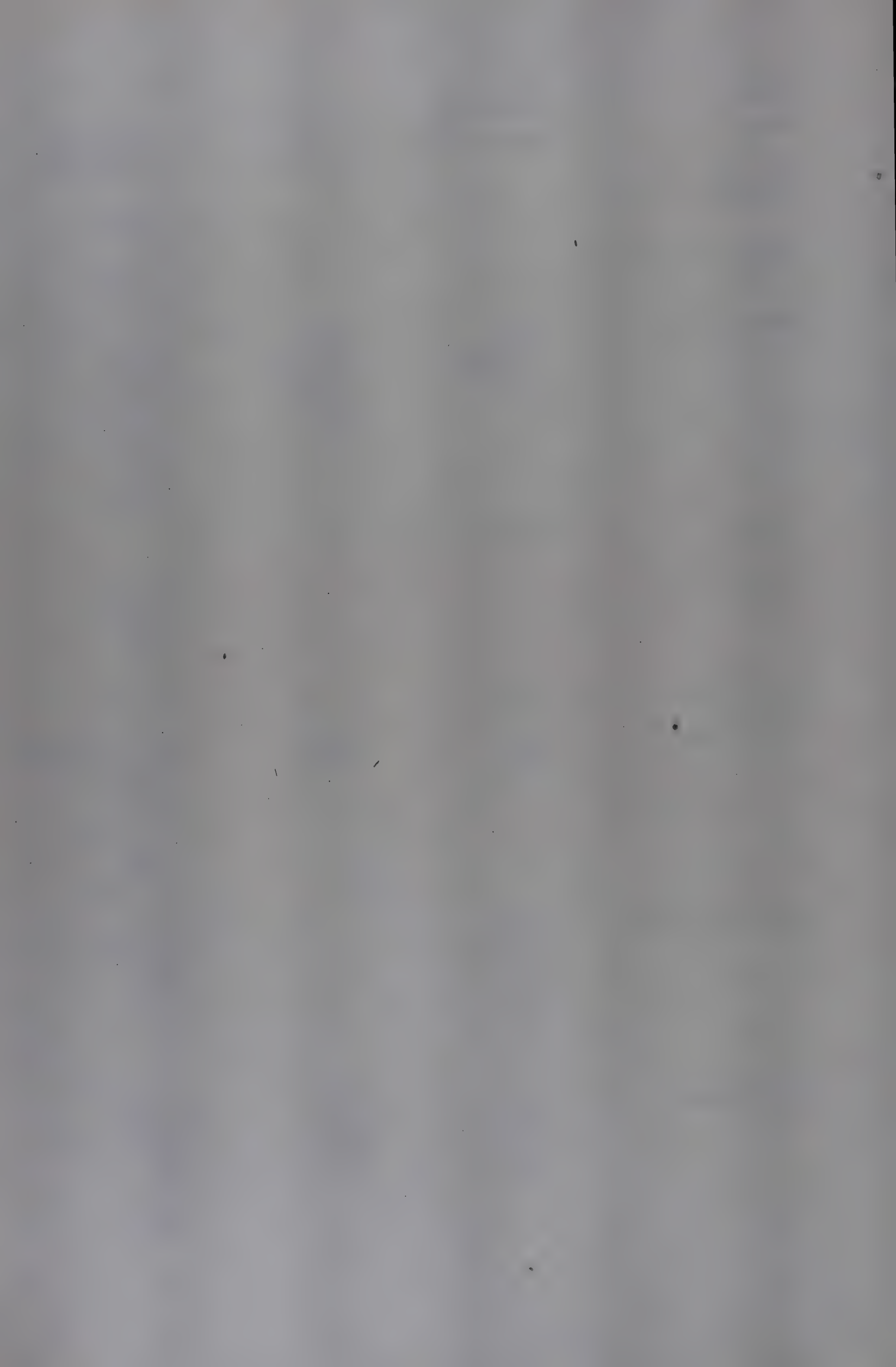


Table 1The location of CSIR Laboratories and Extension Centres

<u>Area</u>	<u>CSIR Lab.</u>	<u>Coop. Res. Lab.</u>	<u>Extension Centres</u>
Andhra Pradesh	NGRI ✓ RRL(H) ✓	-	CFTRI CPHERI
Assam	RRL(Jt) ✓	TES(TRA)	-
Bihar	NML ✓ CMRS ✓ CFRI ✓	-	CFRI
Delhi	NPL ✓ CRRI ✓ INSDOC ✓ PID ✓	CRII	CSIO CPHERI IIP
Chandigarh	CSIO ✓	-	Indo-Swiss Training Centre
Goa, Daman & Diu	NIO ✓	-	-
Gujarat	CSMCRI ✓	ATIRA	CPHERI NML CBRI CLRI
J & K	RRL(Ju) ✓	-	RRL(Ju)(Branch) CIMPO CFRI DRL
Karnataka	CFTRI ✓ NAL ✓ VITM ✓	IPIRA	CIMPO INSDOC CFTRI

<u>Area</u>	<u>CSIR Lab.</u>	<u>Coop. Res. Lab.</u>	<u>Extension Centres</u>
Kerala	-	-	CFTRI NIO
Madhya Pradesh	-	-	CPHERI CFRI
Maharashtra	NCL ✓ CPHERI ✓ MSTM ✓	BTRA SASMIRA IRMRA WRA ARAI	CFTRI CFRI MERADO CPHERI CLRI NIC IRMRA TICCI
Orissa	RRL(B) ✓	-	-
Punjab	-	-	MERADO CFTRI CLRI NML
Rajasthan	CEERI ✓	-	CPHERI
Tamil Nadu	CLRI ✓ CECRI	SITRA	CSIR Complex (SERC CSIO CECRI MERADO NML CPHERI)
Uttar Pradesh	CDRI ✓ ITRC ✓ CIMPO ✓ NBG ✓ IIP ✓ CBRI ✓ SERC ✓	-	CFTRI CPHERI CLRI CIMPO
West Bengal	CGCRI ✓ IILEM ✓ BITM ✓ CMERI ✓	IJIRA IPRA IRMRA TRA	CPHERI CLRI CFRI NML IPIRA CSIO MERADO



3. EXTENSION CENTRES OF THE CSIR LABORATORIES

3.1 The existing Centres: A State-wise locational distribution of the existing Extension Centres of the CSIR laboratories is shown in Table 1 (2.3). In the list are also included physical extensions of the laboratories where locational advantage has permitted closer liaison, better work facilities or more efficient functioning. Falling in this category are: IIP's Projects Division, New Delhi, RRL(Ju)'s Branch at Srinagar, NIO's Biological Oceanography and Indian Ocean Biological Centre, Ernakulam, and INSDOC's Regional Centre, Bangalore.

The Committee visited some selected Extension Centres, CSIR Complex, Madras and RRL, Jammu and its Branch at Srinagar to acquaint itself at first hand with their scope, operation and usefulness. Assignment, facilities, organisational problems and effectiveness of these Centres were discussed with the Scientists-in-Charge and other senior Scientists. The Committee collected only that information which was relevant to its present assignment and which helped in greater understanding of working of these Centres and in suggesting any improvements in their scope and functions as a part of our recommendation. The itinerary of these visits is appended. (Appendix XIII).

The Extension Centres of CSIR laboratories are briefly described below:

NML: Foundry Field Stations of NML at Batala (Punjab), Madras (CSIR Complex), Howrah and Ahmedabad render technical guidance in proper selection of foundry

materials, analysis of ferrous and non-ferrous alloys, testing sands, etc. Technical enquiries on which ready information is not available are passed on to NML.

Marine Corrosion Research Station of NML at Digha (West Bengal) is assigned the task of studying corrosion under marine environmental conditions.

CSIO: CSIO has Service and Maintenance Centres at Delhi, Calcutta and Madras (CSIR Complex). As the title indicates, these Centres are only to service and maintain instruments of industries located in the region. Because of its location (in CSIR Complex and in the midst of several technological institutions), the Madras Centre of CSIO is also involved in interdisciplinary R & D projects. CEERI's Unit at New Delhi only provides facilities for servicing TV sets manufactured by the Institute.

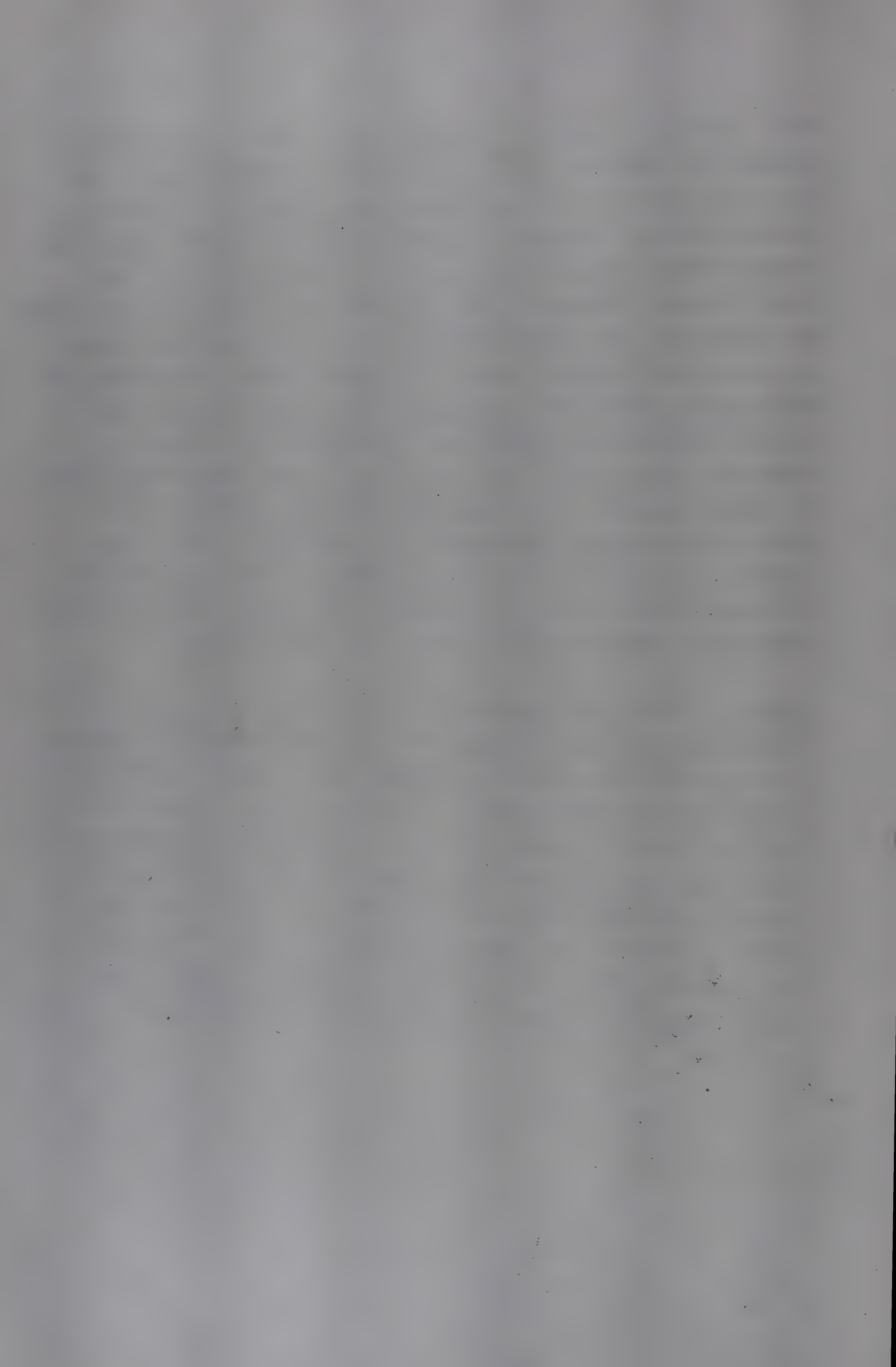
CBRI: Extension Cells of CBRI at Ahmedabad, Delhi and Bhopal function as information and demonstration Centres. With acute housing problem all over the country, these centres need to be enlarged and consultancy service included in their assignment.

CFRI: CFRI's Coal Survey Laboratories are situated at Ranchi, Jammu, Bilaspur (M.P.), Jorhat, Nagpur and Ranigunj. These Centres carry out survey of availability of coal in their respective region, assess the quality of borehole coal cores, undertake physical and chemical analysis of coals and determine the washability characteristics of coals.

CIMPO: Agro-climatic conditions obtaining in the area

have determined the location of Zonal Centres of CIMPO at Bangalore, Haldwani (U.P.) and Jammu (and Srinagar). In the unrepresented Zones, RRL(Jt) and RRL(B) have taken up studies which normally would have done by CIMPO. There is considerable overlap of activity in this field at Jammu and Srinagar (between CIMPO and RRL(Ju)). The main objectives of CIMPO and its Zonal Centres are to cultivate aromatic and medicinal plants suited to agro-climatic conditions of the region, carry out cultural and related studies and develop methods of commercial extraction of active or aromatic principles. All the Centres have very large farms at their disposal and Jammu and Srinagar Centres also manufacture drugs, pesticides and essential oils. The farms are generally run on experimental line and there is a considerable scope for running these on commercial basis, earning in many cases, valuable foreign exchange.

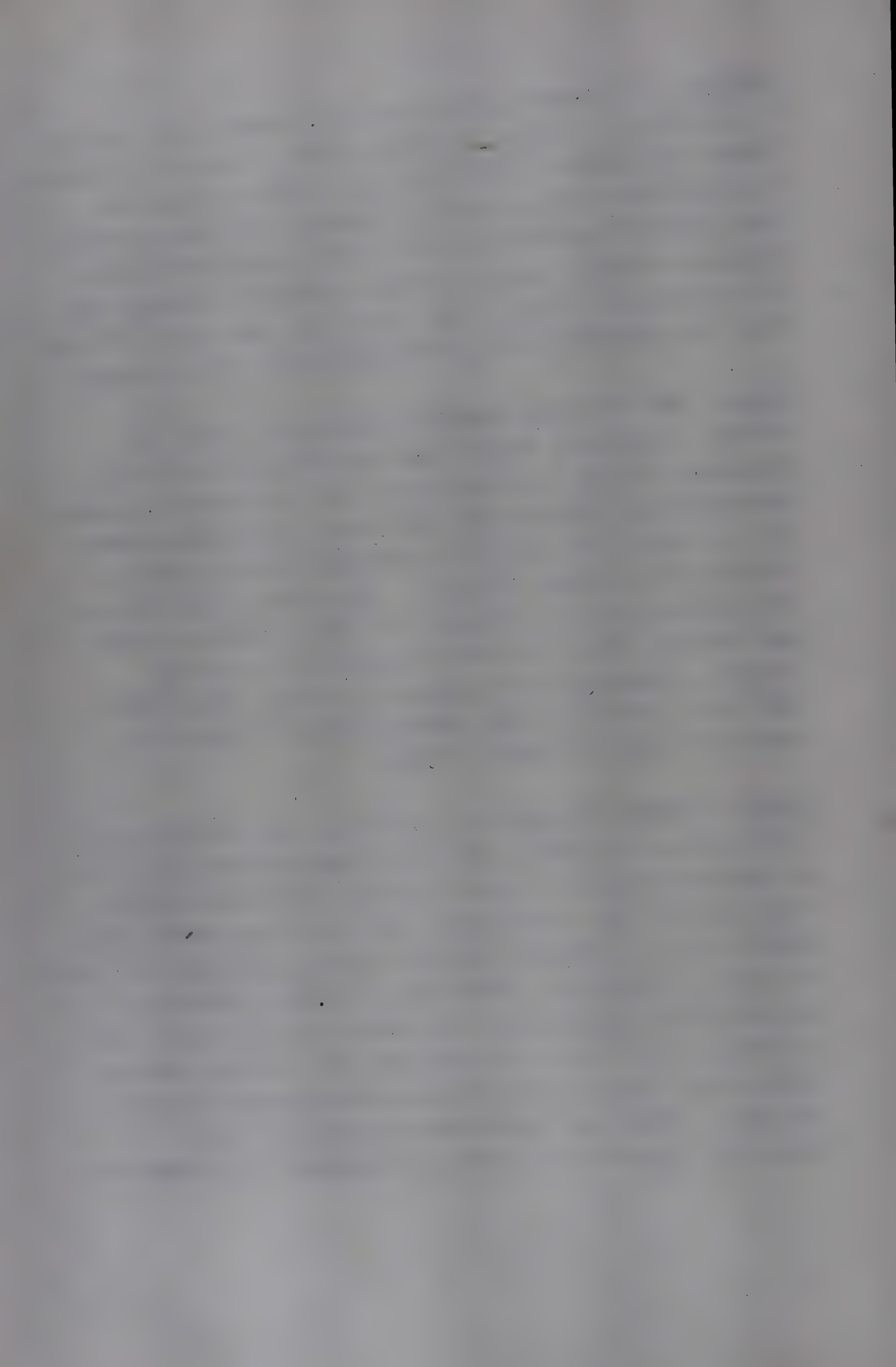
CFTRI: CFTRI has Experimental Stations at Trichur, Lucknow, Hyderabad, Bombay, Nagpur, Ludhiana and Mangalore. Their location has been chosen largely due to agro-climatic and geographic considerations. All these Centres have been assigned similar functions, e.g. information, demonstration, field experiments and other expansion activity but R & D content and facilities provided at some are comparatively greater. Their activity is planned as part of total activity of CFTRI and the work of these Centres is not shown separately in the Reports of the Institute.



CPHERI: The Zonal Laboratories of CIPHERI are located at Ahmedabad, Bombay, Calcutta, Delhi, Hyderabad, Jaipur, Kanpur and Madras (CSIR Complex). A Sub-Centre has recently been established at Baroda. All these Centres are involved in project work, consultancy and analysis related to water supply, sewage, effluent disposal and air pollution. Most of the activity, especially project work is coordinated and even directed by HQ at Nagpur.

CLRI: CLRI has four Regional Extension Centres at Bombay, Jullunder, Kanpur and Calcutta and one Field Extension Centre at Rajkot which act as information-cum-demonstration Centres and also serve as clearing house of new ideas which may have emanated from the work of parent CLRI or these Centres. They also resolve day to day difficulties of producers of hides, skins, leather and leather goods and provide guidance on quality control, especially for items of export. Like CFTRI, CLRI also reports of the work of these Centres as an integrated part of total output.

CMERI: MERADO, planned as a separate but complementary organisation to CMERI, with HQ at Durgapur and with three Extension Centres at Poona, Ludhiana and Madras (CSIR Complex)-does not concentrate on advanced research like CMERI, but is concerned with the less complicated problems of local industries. CMERI will, however, serve as a consultative organisation for advice and guidance. The Government may decide to establish more Centres and/or sub-Centres in the light of experience gained at these Centres. CMERI and MERADO have common EC and a Technical Information Centre at Durgapur. The functions



of MERADO Centres are: survey of product demand, development and improvement of products, to aid industry in developing better production method and improving productivity, inspection and testing, training of personnel, technical information and liaison. MERADO Centres bring out their own Annual Report. A summary of their activities is, however, published as part of CMERI Report. The two institutions have common staff and the staff members are intertransferable.

CECRI: CECRI has only one Extension Centre as a part of CSIR Complex at Madras. Its functions are: extension, consultancy, demonstration and trouble shooting in the area of electrochemical technology. The Centre also acts as a purchase agency of the parent laboratory for purchases at Madras.

SERC: The Regional Centre of SERC in CSIR Complex is a full-fledged research institute devoted to R & D on structural engineering. Director, SERC is also the Coordinating Director of CSIR Complex at Madras.

Thus, the functions, assignment, size and consequently the activity of each group of centres are diverse. The manner of control of these Centres by the parent laboratories, however, appears to be a common feature.

3.2 CSIR Complex, Madras: Situated in the vicinity of CLRI, IIT, ACCT, College of Engineering, Institute of Mathematical Sciences, Central Polytechnic, Technical Teachers' Training Institute and Highway Research Station of Tamil Nadu Government, the 62-acre campus



of CSIR Complex at present houses SER(R)C, MERADO, CECRI Centre, S & M Centre of CSIO, Field Station of NML and Zonal Centre of CIPHERI. Each constituent Centre of the Complex is headed by a Scientist-in-Charge. Director, SERC functions as a Coordinating Director of the Complex.

The Complex is a new experiment where a wide spectrum of skills have been placed side by side and under "one roof" which will promote interdisciplinary interaction and thus can lead to undertaking multidisciplinary projects to assist the industry. Several bridges, however, will have to be crossed before the constituent units adopt a common approach towards solution of industrial problems through multidisciplinary efforts. The main hurdle appears to be the "differing functions and divergent goals" of each Centre operating in the Complex. While SER(R)C functions as a fullfledged research and development institute, the S & M Centre of CSIO and Foundry Station of NML have been allotted only service functions by the parent laboratories. MERADO fits somewhere in between, performing service functions and also undertaking design and fabrication of machinery and equipment. Also there is overlap of work between NML Centre and MERADO, with divergent charges for testing and analysis.

The scope, role, goal and future development of the CSIR Complex at Madras were discussed in a meeting of Directors and Heads of the participating units in June 1973. A background paper by Prof. G.S.Ramaswamy (Appendix VII) and minutes of the meeting (Appendix VIII) are appended.

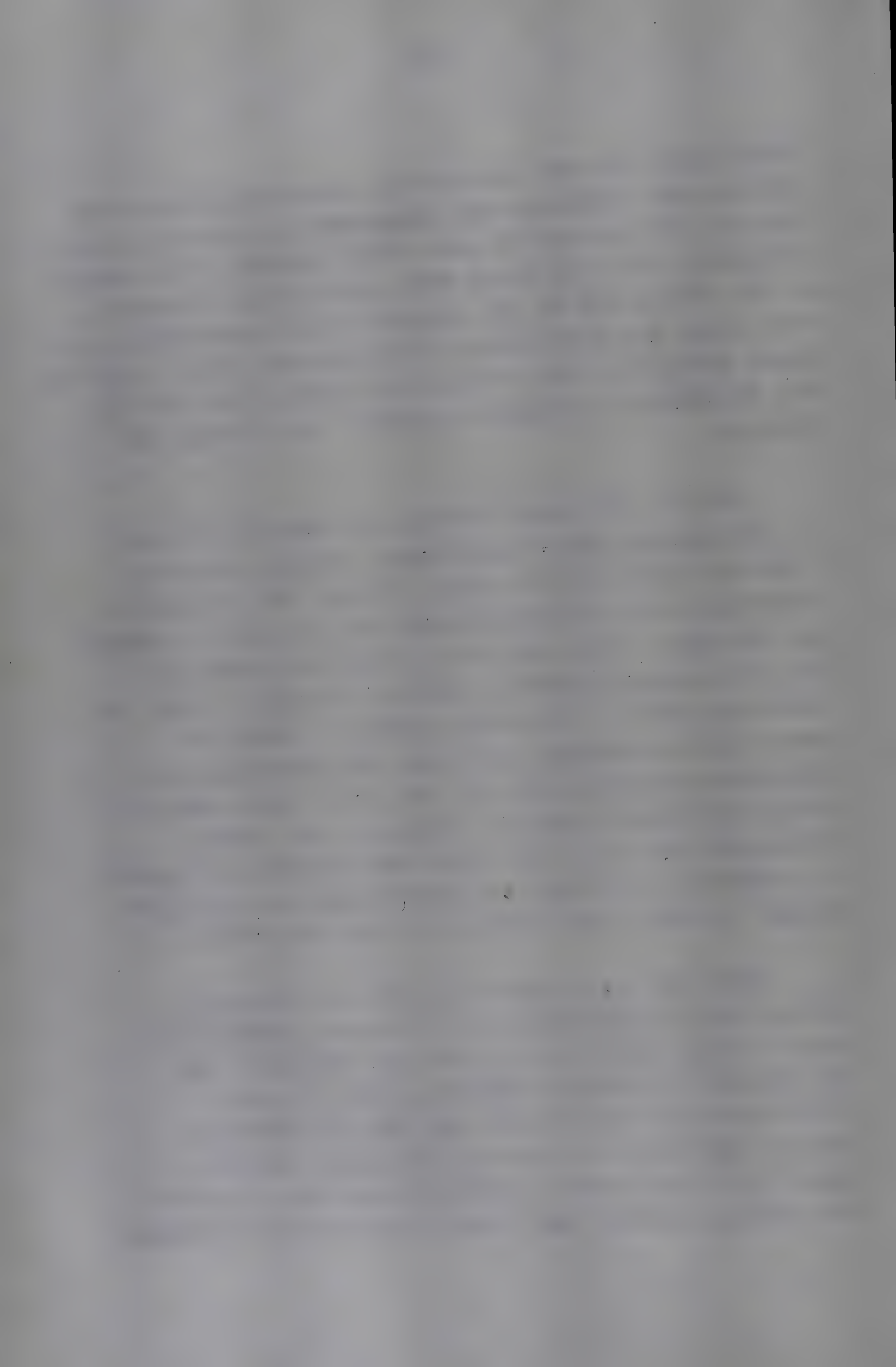
Because of differing functions and goals, the constituent Centres have varied staffing pattern. Even the responsibility, status and powers delegated to Scientist-in-Charge vary a great deal. The dual authority exercised on the Centres is not conducive to the promotion of interdisciplinary culture. In common with Extension Centres operating elsewhere in the Country, the Scientist-in-Charge looks to his parent laboratory for instructions and guidance since he is professionally and administratively bound with it. In fact, some Directors feel that centralisation of administration in CSIR Complex is contrary to the trend of decentralisation elsewhere in CSIR. It is the view of the Committee that the Scientist-in-Charge of the Centres should have **equal** status with sufficient powers delegated to them to take decisions for effective functioning as constituent Centres of a Complex. Coordination functions are rotated amongst these equals in contrast to the present arrangement. It is necessary to stress that the management pattern of a Complex comprising several semi-autonomous Centres having links with their parent laboratories needs to be different from that of laboratories having several divisions.

3.3 General observations: Table 1 shows that mere location of specialised R & D Centres in an area does not by itself lead to the development of the region. One reason for this situation appears to be insufficient communication links with industry and the government. In contrast, Extension Centres, by virtue of their assignment and specialisation develop, nurture and strengthen

these links and are thus able to serve the governmental agencies and industry more pragmatically and effectively. They do not function as mere "show windows" of the parent laboratory but work along with others in the factories, in the fields and in the quality control laboratories, to understand the problems at first hand and render solutions where possible. This interaction between the user and the Scientist is of prime importance in planning for future.

Not all Extension Centres are equally effective in discharging their obligations. Firstly, there is a lack of uniformity in their set up. The assignment, functions, size and consequently the activity of centres are diverse. There are also problems of leadership and professional direction both at the level of the Centre as well as the parent laboratory which are reflected in staffing, equipping and rendering other assistance to these Centres. The rigid administrative, financial and professional control by the parent laboratory also does not create the desired environment of initiative and innovation/attracting competent/for people to work at the centres by their own choice.

This has also resulted in lack of interaction between two or more Centres of different laboratories even if they are located in the same vicinity CFTRI and MERADO at Ludhiana, MERADO and NCL at Poona, constituents of CSIR Complex and CLRI at Madras or RRL(Ju) and CIMPO at Jammu and Srinagar. In fact, there is a considerable overlap between the programmes of CIMPO and RRL(Ju) and there is duplication of testing



facilities between NML and MERADO but schedule of charges for the same test are different since these have been fixed by the respective parent laboratories. It creates embarrassment for both, if they happen to be on the same campus as at CSIR Complex, Madras. To sum up, the functions of each Centre are determined by the parent laboratory which retains the residual extension activity. Since the CSIR policy in this regard is flexible, different centres have been performing varying functions. This is reflected in the staffing policies of the Centre, delegation of powers to the Scientist-in-Charge and even his status, geographical area of operation and the total content of extension activity. With the present day accent on interdisciplinary and multidisciplinary activity, it will be necessary to bring different centres closer to each other, activity-wise and status-wise.

3.4 The proposals for new extension and related activity under the Fifth Five-Year Plan of the CSIR: The proposals received from different laboratories and the HQ of the CSIR for setting up additional facilities by way of Extension Centres, Information Centres, Branch Laboratories, etc., have been summarized in Table 8 of the Fifth Five-Year Plan of the CSIR and has been reproduced here (Appendix IX). Suggestions for establishing new institutes are incorporated in the Plan (Table 9) and these are appended (Appendix X).

Several of these proposals relate to an extension/intensification of an existing activity or undertaking of a new activity as a part of the programme the national laboratories by establishing new divisions

or subsidiary units located at the institute and under its control. Falling in this category are:

Field Station for Radio Science (NPL);
 Airborne Geophysical Survey Facility (NGRI);
 Groundwater Surveys (NGRI);
 Production of Geophysical Instruments (NGRI);
 Organisation and Development of Indian National
 Oceanographic Data Centre (NIO);
 Chemical Engineering Research Centre (NCL);
 Rural Building Division (CBRI);
 Model Analysis Laboratory SER(R)C;
 Information Centre for Aeronautics (NAL);
 Turbomachinery and Combustion Laboratory (NAL);
 Materials Science and Technology Research Centre (NAL);
 Consultancy Division and Engineering Design Centre
 (CMERI);
 Corrosion Servicing and Testing Facilities (NML);
 R & D of High Temperature Electrochemical
 Processes (NML);
 Large-scale Hydro-cum-Electrometallurgical Testing (NML);
 Large-Scale Sponge Iron Testing (NML);
 Fermentation Technology Unit (CDRI);
 Regional Centre for Analytical Services (CDRI);
 Biophysics Division (IITEM);
 Food Science and Technology Information
 Centre (CFTRI);
 R & D Centre for Enology and Brewing (CFTRI);
 Milling and Baking Technology Training School (CFTRI);
 Fermentation Technology Unit (CFTRI);
 International Training Centre (CLRI);

Industrial and Technical Information Centre including Data Bank for Leathers (CLRI) and all the programmes under Information Sciences Group comprising the Museums, INSDOC and PID except establishment of a new Museum at "Delhi or elsewhere".

As many as 11 national laboratories have proposed new Computer Centres involving a total outlay of Rs.9.85 crores. Of these, the Centre at NAL already has the clearance from the Electronics Commission and is in implementation stage. Proposal of NGRI and RRL(H) is interrelated. The only proposals for establishing separate autonomous new Centres by shedding part of its present activity are from RRLH (Centre for Advanced Research in Cellular Biology and also Computer Centre).

Proposals involving extension/training activity which widens the geographical area of operation of the national laboratories are:

<u>Proposal</u>	<u>Location</u>
Centres for S & M of Instruments (CSIO)	Srinagar Jaipur/Jodhpur Patna Bangalore Hyderabad Trivandrum
Training of Technicians for S & M of Instruments (CSIO)	Chandigarh

Training Precision Instrument
Technicians in Industrial
Electronics and Die and Mould
Making (CSIO)

Indo-Swiss Training Centre,
Chandigarh

Centre for Training Precision
Instruments Mechanics

Hyderabad

Regional Research Centres
(NGRI)

Bhopal
Jaipur
Patna

Tropical Corrosion Testing
Station (CECRI)

Mandapam (TN)

Extension/Demonstration Centres
(CECRI)

Bombay
Calcutta

Sub-Stations of RRL(Jt)

Yaongyimsen (Nagaland)
Agartala (?) (Tripura)
Imphal (Manipur)
Itanagar (Arunachal Pradesh)
Barapani (Meghalaya)

Regional Research Stations(CRRI)

BC Soils Area
Desert Area
Heavy Rainfall Area

MP or AP
Rajasthan
Kerala, Maharashtra or
Assam
J & K or HP

Snow-bound and High Altitude
Area

Regional Extension Centres(CMERI)

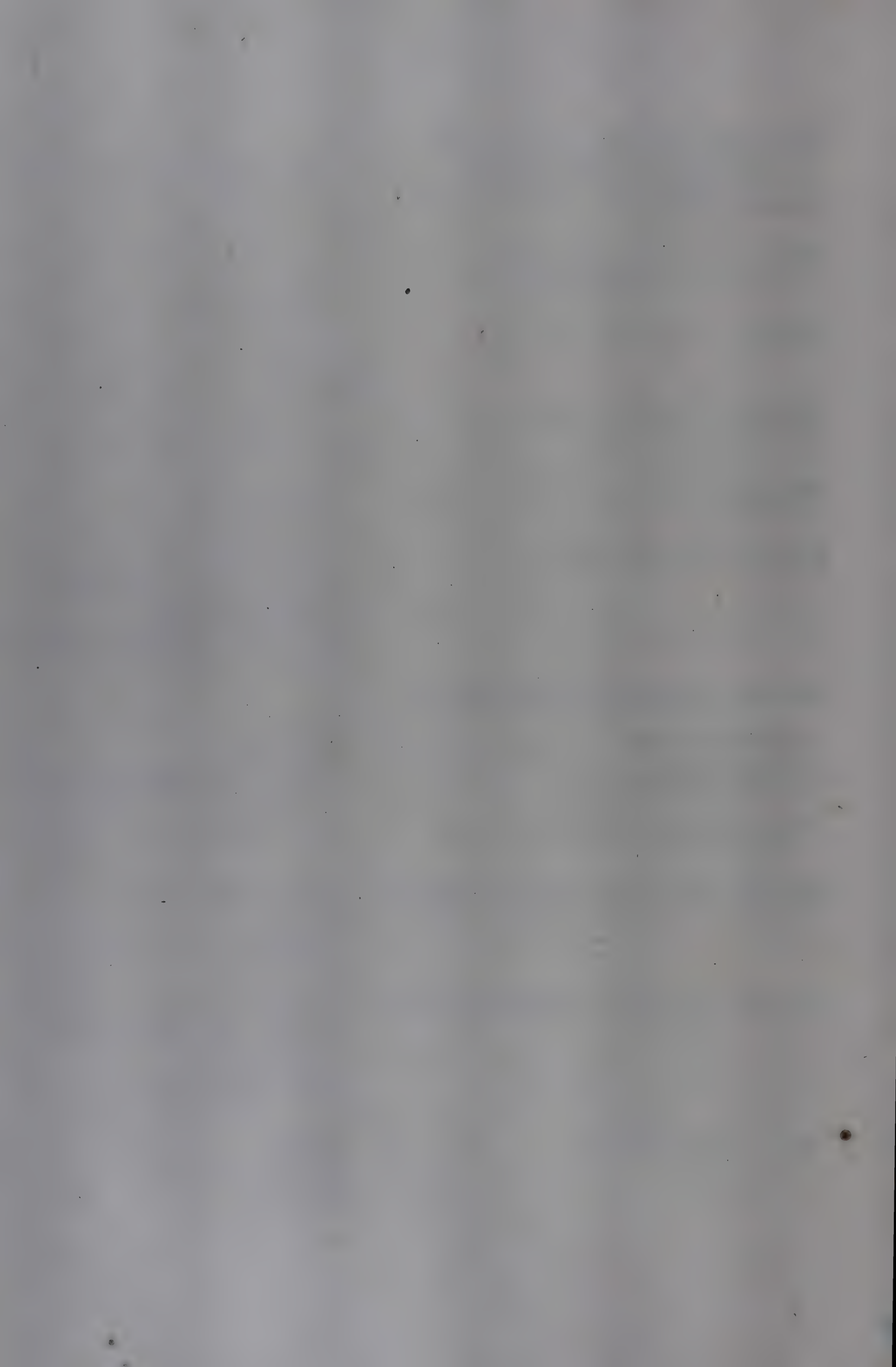
Trivandrum
Jaipur
Lucknow
Ahmedabad

Regional Extension Centres(CGCRI)

Ahmedabad
(Operating Since 1973)
Trivandrum
Thana-Belapur
Road (Maharashtra)

Field Centres(ITRC)

Delhi
Bombay
Calcutta
Madras



Field Station RRL(Ju)	Kangra Valley (HP)
Field Station for Sea water corrosion studies (NML)	East Coast
Zonal Centres (CIMPO)	West Bengal/Assam Maharashtra

Proposals which have high extension/information/Service content and which have been included under extension/intensification of existing activity or a new activity at the national laboratories are:

Air-borne Geophysical Surveys (NGRI)
 Groundwater Surveys (NGRI)
 Production of Geophysical Instruments(NGRI)
 Indian-National Oceanographic Data Centre (NIO)
 Information Centre for Aeronautics (NAL)
 Consultancy and Engineering Design Centre (CMERI)
 Corrosion Servicing and Testing (NML)
 Hydro-Cum-Electrometallurgical Testing (NML)
 Sponge Iron Testing (NML)
 Regional Centre for Analytical Services (CDRI)
 Food Science and Technology Information Centre(CFTRI)
 Training School for Milling and Baking
 Technology (CFTRI)
 International Training Centre (CLRI)
 Industrial and Technical Information Centre and
 Data Bank on Leathers (CLRI)
 All proposals under Information Sciences Group

The V Plan proposals from the national laboratories thus include 42 new extension centres in addition to new or expanded extension activity at the laboratory itself.



There are 15 proposals of the latter category. These do not include proposals made by Information Sciences Group. Considering that the existing number of extension centres is 48, the proposed activity does suggest a new emphasis on closing the communication gap between the generator and user of scientific and technical knowledge. The proposals not only cover some areas like roads, geophysics and toxicology not represented earlier on the extension service map of CSIR, but also extend this activity to some uncovered geographic locations. Table 2 gives the location of proposed Centres as superimposed on the existing activity, already shown in Table 1 (2.3). It may be seen that the most of the areas will have added extension activity and some areas especially in the eastern region will have this service for the first time. Coupled with proposals to set up Information Centres, polytechnological Clinics and Testing and Analysis Centres in different parts of the country, a major gap will be filled and as a result R & D will be brought closer to the ultimate user and beneficiary--the man.

Table 2

The location of CSIR Laboratories and Extension Centres
(incorporating the V Plan proposals)

Area	CSIR Lab.	Coop.Res. Lab.	Extension Centres	New Extension [®] activity at the HQ of the Lab.
Andhra Pradesh	NGRI RRL(H)	-	CFTRI CPHERI *CSIO(2) *CRRI(?)	NGRI(3)



Area	CSIR Lab.	Coop.Res. Lab.	Extension Centres	New Extension [@] activity at the HQ of the lab.
Assam	RRL(Jt)	TES(TRA)	*CIMFO(?) *CRRI(?)	-
Arunchal Pradesh	-	-	*RRL(Jt)	-
Bihar	NML CMRS CFRI	-	CFRI *CSIO *NGRI	NML(3)
Delhi	NPL CRRI INSDOC PID *Museum	CRRI	CSIO CPHERI IIP *ITRC	All proposals of Information Sciences group
Chandigarh	CSIO	-	Indo-Swiss Training Centre *Training of Technicians for S & M of Instru- ments *Training of Precision Instruments Technicians	-
Goa, Daman and Diu	NIO	-	-	NIO
Gujarat	CSMCRI	ATIRA	CPHERI NML CBRI CLRI *CGCRI *CMERI	-
Himachal Pradesh	-	-	*REL(Ju) *CRRI(?)	-

Area	CSIR Lab.	Coop.Res. Lab.	Extension Centres	New Extension @ activity at the HQ of the Lab.
J & K	RRL (Ju)	-	PRL (Ju) Branch CIMPO CFRI DRL (CIMPO) *CRRI (?) *CSIO	-
Karnataka	NAL CFTRI VITM	IPIRA	CIMPO INSDOC CFTRI *CSIO	NAL CFTRI
Kerala	-	-	CFTRI NIO *CSIO *CRRI (?) *CMERI *CGCRI	-
Madhya Pradesh	-	-	CPHERI CFRI *CRRI (?) *NGRI	-
Maharashtra	NCL CPHERI MSTM	BTRA SASMIRA IRMRA WRA ARAI	CFTRI CFRI MERADO CPHERI CLRI NIC IRMRA ICCI *CECRI *CRRI (?) *CGCRI *ITRC *CIMPO	-
Manipur	-	-	*RRL (Jt)	-

Area	CSIR Lab.	Coop.Res. Lab.	Extension Centre	New Extension@ activity at the HQ of the Lab.
Meghalaya	-	-	*I PL(Jt)	-
Nagaland	-	-	*RRL(Jt)	-
Orissa	RRL(B)	-	*NML(?)	-
Punjab	-	-	CLRI MERADO CFTRI NML	-
Rajasthan	CEERI	-	CPHERI CSMCRI *CSIO *NGRI *CRRI *CMERI	-
Tamil Nadu	CLRI CECRI	-	CSIR Complex (SERC CSIO CECRI MERADO NML CPHERI) *ITRC *CECRI *NML(?)	CLRI(2)
Tripura	-	-	*RRL(Jt)	-

Area	CSIR Lab.	Coop. Res. Lab.	Extension Centre	New Extension [@] activity at the HQ of the Lab. ^{1,2}
Uttar Pradesh	CDRI ITRC CIMPO NBG IIP CBRI SERC	-	CFTRI CPHERI CLRI CIMPO *CMERI	CDRI
West Bengal	CGCRI IIEM BITM CMERI	IJIRA IPRA IRMRA TRA	CPHERI CLRI CFRI NML IPIRA CSIO MERADO *ICCI *CIMPO(?) *ITRC *CECRI *NML(?)	CMERI

Note: (?) indicates an alternative location

@ no. in parenthesis indicates the number of proposals

* new centres

4. SUGGESTED CHARACTER AND FUNCTIONS OF THE REGIONAL EXTENSION CENTRES

4.1 Character: The general approach towards establishing a Regional Extension Centre should be:

it should fill the need of an industry or a region or both;

it should fit into an overall plan of development of the country or the region;

it should be able to promote interdisciplinary research culture;

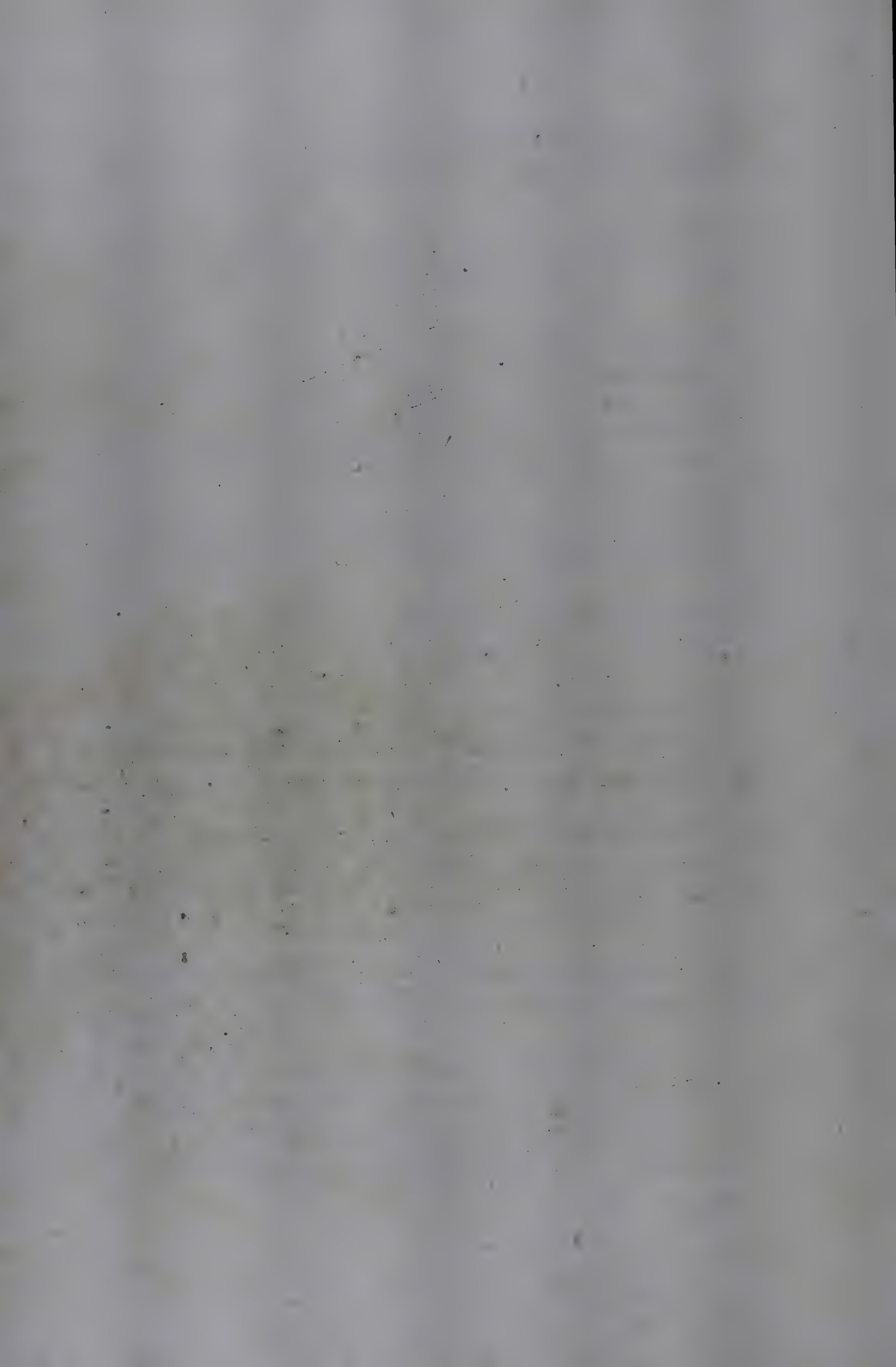
it should forge communication links to cover the entire innovation chain;

it should programme its work to suit the needs of user and endeavour to develop his competence to utilise the available resources; and

it should have "modern, decentralised and internalised management with authority delegated down the line".

4.2 Functions/Objectives: The main functions/objectives of the Regional Extension Centres are:

To survey the existing industry, study the development plans and assess the resources and potential of the region and project this knowledge into the development programme of the Centre;



to develop, maintain and extend communication links with the governments, industry and their agencies, especially Chambers of Commerce, Development Corporations, SISI, and with the universities and other R & D institutions of the region;

to act as a clearing house of new ideas developed at the parent laboratory by participating activity in the transfer of technology by demonstrations. to test the viability, after sales service, etc.;

to conduct R & D on projects which are specially suited to the Centre on account of agro-climatic and other relevant factors, and on trouble-shooting aspects of problems of industry and for which facilities are available at the Centres;

to participate in joint R & D programmes with other Centre(s) to provide interdisciplinary inputs in solving a problem;

to conduct efficiency studies and suggest improvements and to advise on day-to-day problems of industries;

to provide consultancy service including one on annual retainer basis to the user industry of the region;

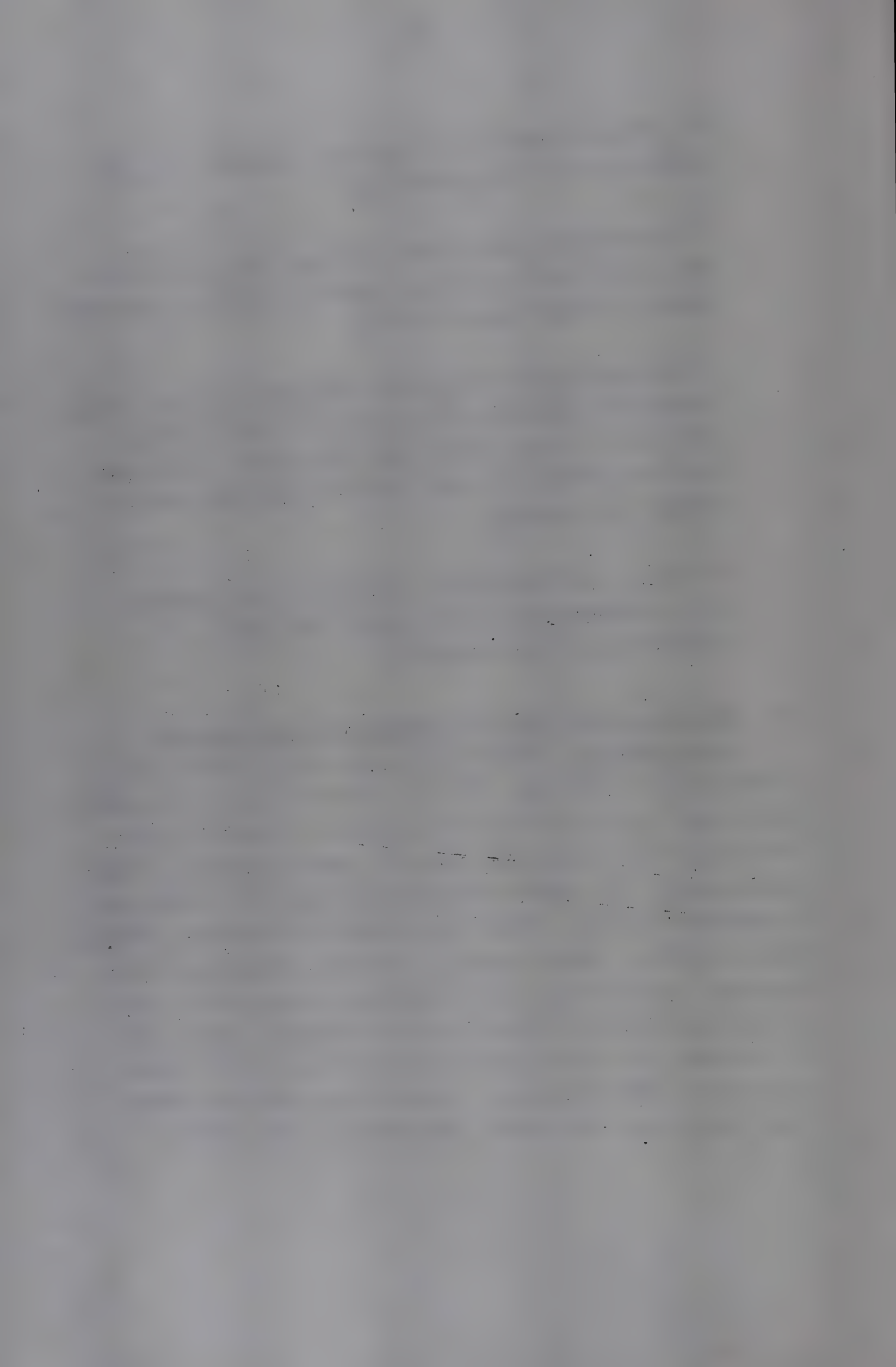
to prepare feasibility/project reports for the industry and the government;

to establish specialised testing and analytical facilities and to advise user industry on problems related to quality control;

to collect and disseminate through available media technical information related to the fields of activity of the Centre and the parent laboratory and to provide liaison between the user and the parent laboratory;

to refer to the parent institute or elsewhere any problems which are beyond the scope or facilities of the Centres.

4.3 Extension Centres as instruments of regional development: Specialised research laboratories function at a national plane¹²³. They do handle problems which may relate to a given region but these will be concerned only with the field of specialisation of the laboratory. The developmental problems of a State lie in several fields. These may relate to housing, roads, public health, pest control, chemical industry, food, leather, engineering and metallurgy or ceramics, etc. It is therefore not possible for a single laboratory to advise, let alone provide solutions to all these problems. Laboratories based on the model of RRLs thus will also not answer the needs of the States.



Extension Centres of specialised laboratories, located in different regions will, however, be more useful in this respect for many reasons. Firstly, these Centres have mandate to render service in the area of their location. They also have the backing of specialised knowledge and facilities of the parent institute and hence are in a better position to provide a solution. If Centres of several specialised laboratories are located in one area, the region can derive benefits of specialised knowledge in as many fields and if these Centres are located on one campus, the spectrum of knowledge to be communicated to the user gets further multiplied on account of interdisciplinary interactions. The Committee, therefore, is convinced that the Extension Centres of CSIR laboratories should be used extensively as instruments of development of various states and regions.

Developmental activity of these Centres, apart from the technical assistance from the parent laboratories, will also be supported by the complementary activity of the proposed Polytechnological Centres (Section 6).¹²³

5. THE MANAGEMENT OF THE EXTENSION CENTRES

5.1 General considerations: Limitations under which Extension Centres function have already been mentioned (3). These are also reflected in the working of CSIR Complex at Madras where several Extension Centres having different mandates from their parent laboratories have been physically placed together. These limitations and consequent restricted operation of the Centres arise partly due to insufficient appreciation of the role of these Centres. The Centres have generally not been seen as instruments of progress of the country through regional development, but only as distantly located limbs of the parent laboratory. This has resulted in an insufficiently coordinated approach and direction, and consequent lopsided growth of Centres of different laboratories. Some like MERADO or SER(R)C are almost fully-grown institutes while others like NML Field Centres have not yet been able to establish complete facilities of testing and analysis. That almost all the Centres have done well and created good image of CSIR under these circumstances is commendable.

The Committee visited the CSIR Complex at Madras and had discussions with the Coordinating Director and Scientists-in-Charge of the constituent units. We were also provided with documents which are appended (Appendices VII and VIII). That this visit was at the end of tour itinerary was deliberate since the Committee was deeply interested in examining this model for a possible duplication elsewhere with or without any modification. While the Complex has built a good image in a short time, it is faced internally with some

management problems. Some of these arise out of divergence of approach of participating laboratories and the others are due to difference in the size, assignment and activity of the constituent Centres. The question of dual control and authority seemed to be the main debatable point. This divergence of approach towards the role and functions of Extension Centres and the rigid control of the parent laboratory is common to all Centres including those located on Madras Campus and has already been stressed in this report. The additional factor at Madras thus is the evolution of a common culture, which sometimes comes in "conflict" with the existing pattern. There is, therefore, urgent need to resolve this apparent or real conflict.

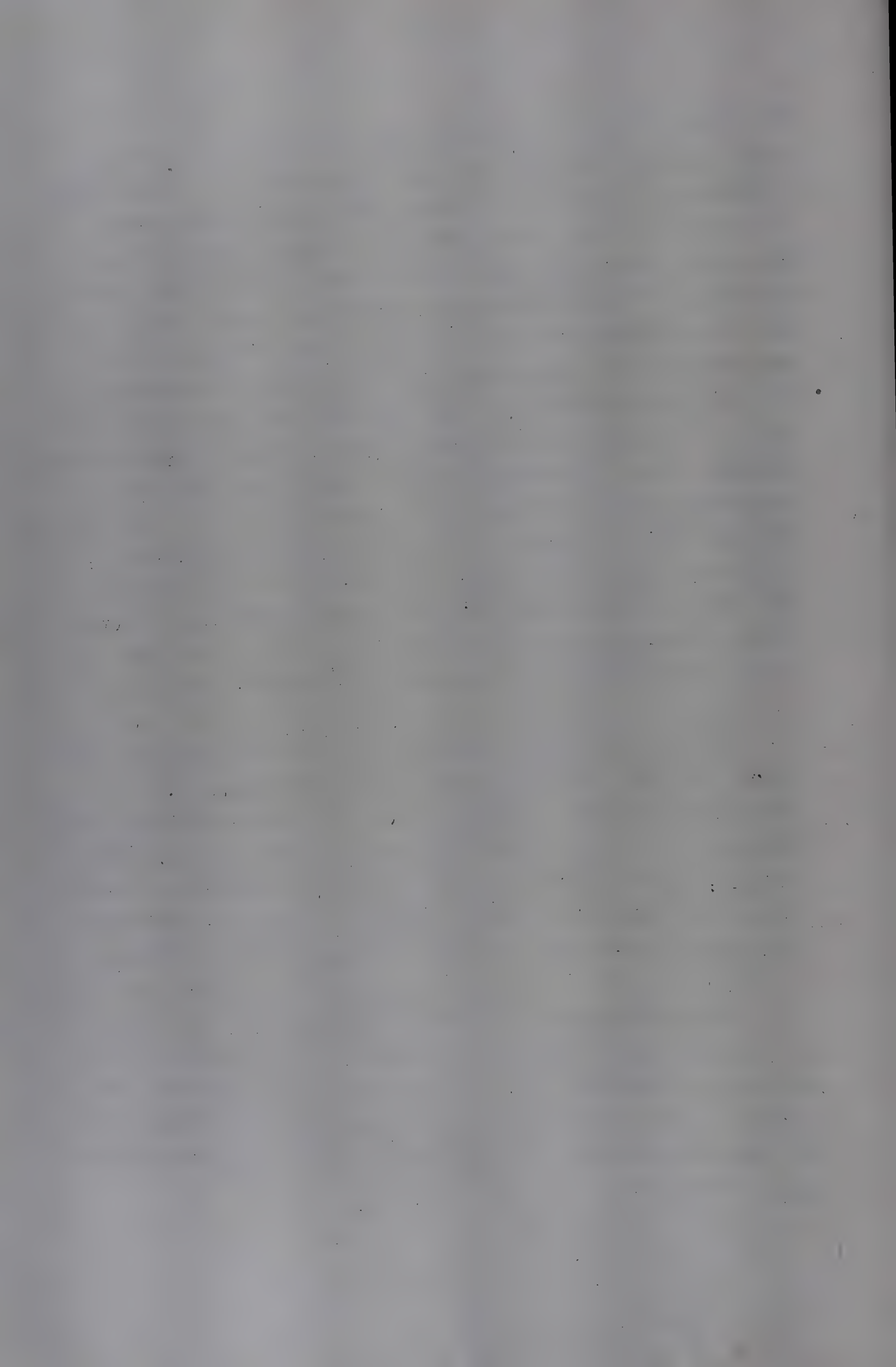
The Scientists at the Extension Centres have professional, intellectual and even personal bonds with parent laboratory. They look to the parent laboratory for professional guidance and advice. These are plan factors in favour of successful functioning of the Centres. The negative side of the picture is presented by the rigid controls exercised by the parent laboratory leaving hardly any scope for initiative to the Scientist-in-Charge.

If administration of the Centres is decentralised and enough authority is delegated to the Scientist-in-Charge, they can take professional, administrative and other decisions without reference to their HQs. Again, if the goals and objectives of Extension Centres of different laboratories are similar, they will be

performing similar functions and will necessarily have similar cadre of staff to man these Centres. Scientists-in-Charge of different Centres with sufficient powers delegated to them and with equal or near-equal status when located on the same campus can discuss their common problems, take decisions and implement them. They can and they should even rotate the coordination of campus activity among themselves. Thus alongwith commonness of goals and objectives, and the size and activity of the Centre, equality of the status of the Scientists-in-Charge, emerges as an important factor in managing the Centres especially those located in a Complex and of the management pattern of the Complex will be necessarily different from that of a laboratory. There will be no Director but only a Coordinator of the multidisciplinary activity of the Complex, who will by rotation look after the common facilities and other mutually agreed aspects.

It is, therefore, proposed that Zonal/Extension/Field Centres of an area be located on one Campus. The advantages of such a location are obvious. The principal gain will be to the user who will now have a multidisciplinary advice and assistance. Thus we will have several CSIR Complexes in different regions of the country each providing assistance combined of several disciplines.

Since Extension Centres/Complexes are being suggested as the principal agencies through which CSIR will assist the states/regions for the development of the concerned areas, it is imperative that the government and industry of the area should be participants, both organisationally and financially.



5.2 Organisational aspects: To perform the tasks assigned to the Regional Extension Centres/Complexes (4), it will be necessary to make them semi-autonomous by delegating more powers to the Scientists-in-Charge of the Centres and yet maintaining professional, intellectual, personal and some administrative links with the parent laboratory. In addition, direct organisational links with the CSIR, HQ (to cater for the infrastructural needs and for planning and coordination) and with the State Governments and the user industry of the region are visualised. These links and other interactions are shown in Fig.1 (at the end of this Section).

A Regional Extension Centre should be headed by a Scientist E/F with financial powers of a Scientist F. Within the Centre, he will have the authority to allot work and sanction leave and tour programmes but will refer to parent laboratory all matters relating to transfers, disciplinary action, etc. Within the scope and facilities of the Centre, he will have freedom to allot priorities to work, undertake new work, take decisions on interdisciplinary collaboration with other Centres/ Local R & D Centres, charge fees for sponsored work and consultancy and other services (as per relevant guidelines) but will periodically report to his parent laboratory all such actions taken.

If a Regional Extension Centre is a part of a Complex, its Scientist-in-Charge will be a member of the Advisory Committee of the Complex and will by rotation function as a Coordinator of the Complex. As a Coordinator, he will be required to perform functional

tasks of planning and executing infrastructural needs of the Complex, preside over periodic meetings of the Coordination Committee (comprising all Scientists-in-Charge of the constituent Centres, Administrative Officer, Accounts Officer), and will generally coordinate the activity of the Complex.

The scientific Advisory Committee of a Complex will be presided over by a Scientist/Technologist nominated by the CSIR in consultation with the State government and the Coordinator will be its Secretary. Other members of the Committee will be:

Scientists-in-Charge of the constituent Centres

Two nominees of the State government or one each from each State if more than one States are involved

Two representatives of the user industries

Scientist-in-Charge of the Polytechnological Clinic located in the State

Scientist-in-Charge of the Coordination Cell at CSIR HQ or any other nominee of DG SIR

Administrative Officer

Accounts Officer

The notice of a meeting of the Scientific Advisory Committee will be sent well in advance (say, 3 weeks ahead) and the Directors of the parent laboratories will also be invited to attend. In their absence, Scientists-in-Charge of the Centres will have the authority to take decisions involving commitment of the parent laboratories.

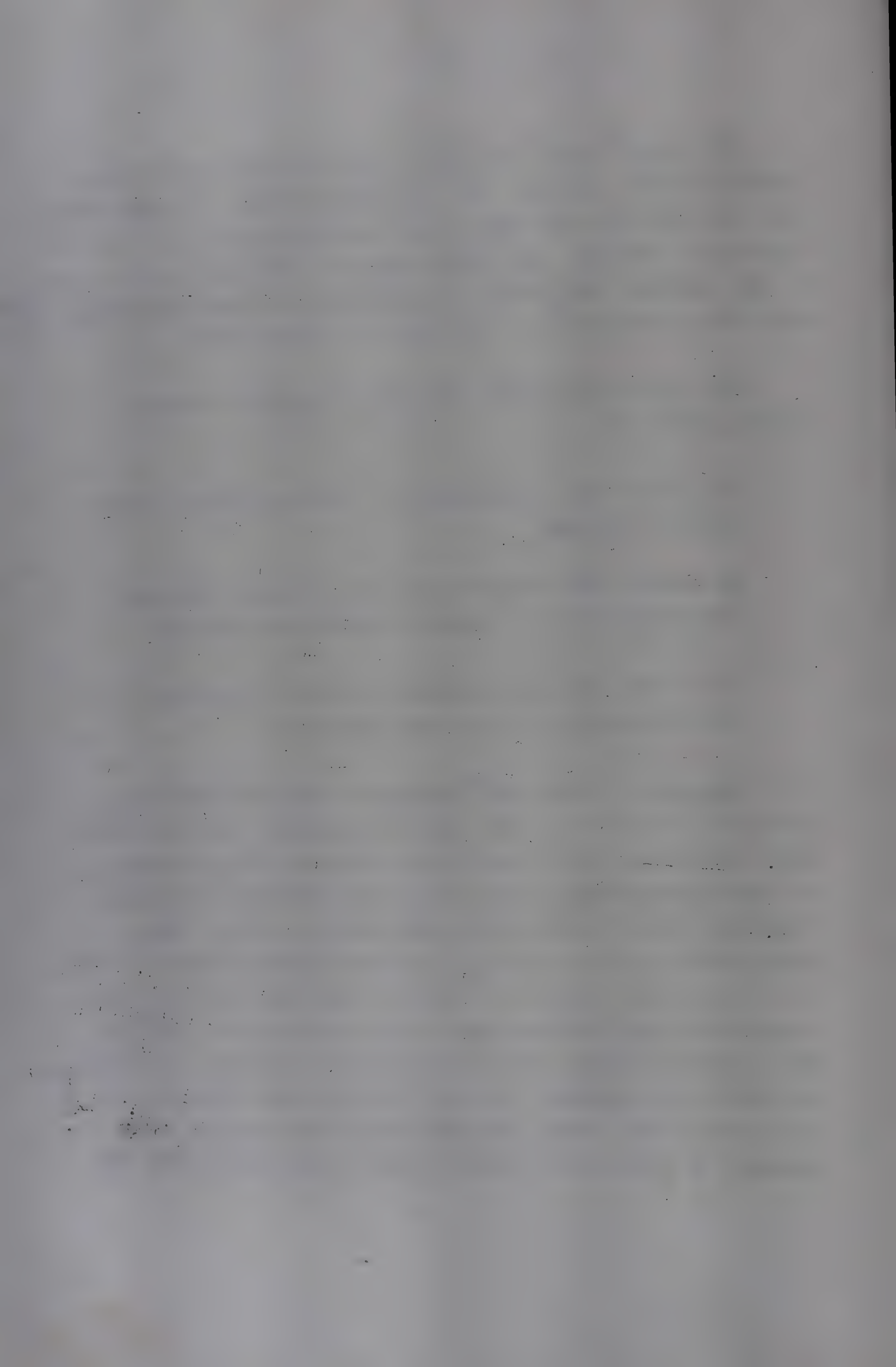
The functions of the Advisory Committee of the Complex will be:

to review and recommend the infrastructural needs of the Complex;

to review the progress of work, examine any new programmes and to suggest overall priorities;

to review and make recommendation on schedule of charges for testing and analysis.

5.3 Funding: Since the Extension Centres/Complexes are being proposed as the major instrument through which CSIR will contribute towards the regional development, it is suggested that the expenditure on these Centres/Complexes must be shared by the region itself. The total outlay of new Centres proposed in the CSIR's V Plan is of the order of Rs.11 crores. This does not include expenditure on the activity at the existing 48 Centres. The regional share (contributed by the regional industry, the State Governments or both) may be sent directly to CSIR, HQ by the State Governments of the region. The details of quantum of share could be discussed with the



respective State Governments. A 50:50 financial participation on the lines of the Cooperative Research Associations is tentatively suggested.

5.4 Likely campuses for grouping extension activities: The concept of locating several Extension Centres on one campus is not new. In fact, in the Report of the Third Reviewing Committee of CSIR (1964, p.43) proposals for setting up such complexes have been made and one Complex is already functioning at Madras. This Committee has merely analysed the present day situation in the light of the requests received from different States, identified the gaps which exist and which need to be bridged, examined the proposals included in the CSIR's Fifth Five-Year Plan and has projected the concept in concrete form by inter-relating the multidisciplinary extension activity with the R & D information and service activities. The Committee's attempt thus has been to transform isolated, single-disciplinary activity into a group, multidisciplinary activity to meet the challenge of the situation.

A reference to Table 2 (3.4) will show that several places in the country will have high concentration of extension activity of different laboratories of the CSIR. These are:

Hyderabad (Andhra Pradesh)
 Jorhat (Assam)
 Patna (Bihar)
 Delhi
 Ahmedabad (Gujarat)
 Jammu (J & K)

Bangalore (Karnataka)
Trivandrum (Kerala)
Bhopal (M.P.)
Bombay (Maharashtra)
Ludhiana (Punjab)
Jaipur (Rajasthan)
Madras (Tamil Nadu)
Kanpur (U.P.)
Calcutta (West Bengal)

Attempts should, therefore, be made to locate Extension Centres here on these Campuses. Interim recommendations with respect to Ludhiana have already been made (Appendix XII).

Many of these cities could also be the location of the proposed Polytechnological Centres (Section 6) which may also be housed on the same campus with advantage. These Campuses can thus emerge as the main vehicle through which CSIR will contribute towards national progress through regional development.

Though the Committee has not studied in detail the area-wise distribution of Extension Centres of each national laboratory, a few suggestions are made here.

Madhya Pradesh and Bihar have a large cattle population. It will be useful to have CLRI Extension Centres at Bhopal and Patna to serve hides, skins and leather industry.

NGRI have proposed to establish three Centre at Jaipur, Patna and Bhopal. The Southern region is intended to be served from NGRI, Hyderabad. It will be of logistic and other advantages to locate another Centre at Madras where infrastructural facilities are already available.

INSDOC's proposals for the V Plan are based at Delhi. There is one Regional Centre operating at Bangalore. It is suggested to locate one more Centre at Calcutta.

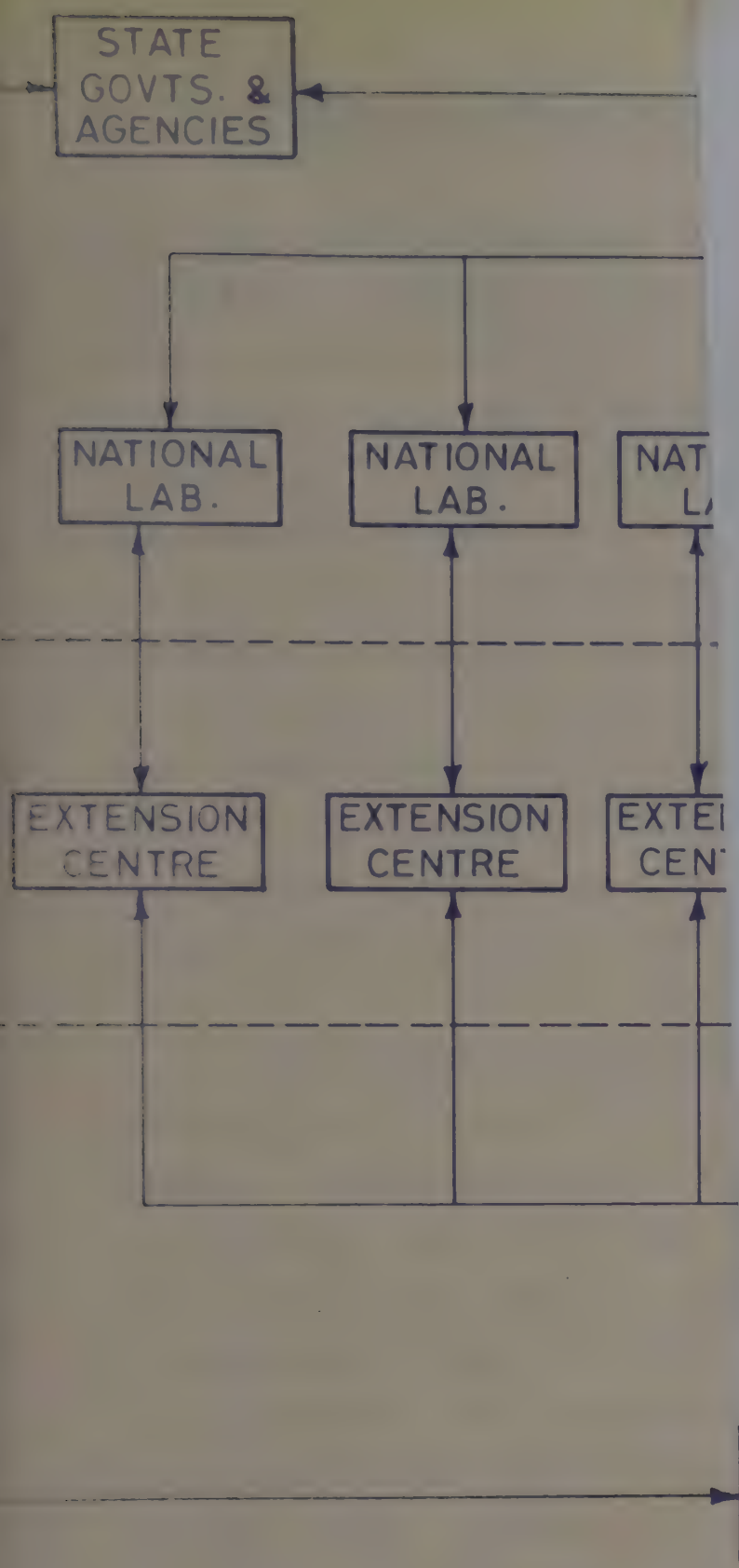


FIG.1. REGIONAL CSIR CO
FUNCTIONAL LINKS

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functions of the Technical Information Centres for various industries proposed to be established during the V Plan period. The Clinics should also be adequately equipped with information to direct the users to an appropriate agency for testing and analytical assistance. In this way, the Polytechnological Clinics can be made the regional focal points of information and technology transfer and also help in building interlaboratory and interdisciplinary bridges.

6.2 Location: Since the Polytechnological Clinics will be required to function as information collection and dissemination centres with ramification of links with the State Governments, their agencies, industry, national laboratories and other R & D Centres, it will be advantageous to locate these on the proposed campuses of the Regional Extension Centres (5.4). A majority of these Clinics will thus be situated in the capitals of the States which will be an added advantage in their functioning. Additional Clinics could be established in the uncovered areas. Thus, the Polytechnological Clinics are, therefore, suggested to be located at: Hyderabad, Jorhat, Patna, Delhi, Ahmedabad, Jammu, Bangalore, Trivandrum, Bhopal, Bombay, Ludhiana, Jaipur, Madras, Kanpur, Calcutta, Chandigarh and Imphal (or any other more suitable location). The Chandigarh Clinic will serve Haryana and Himachal Pradesh, while Jorhat and Imphal (or its alternative) will cater for all the States in the region.

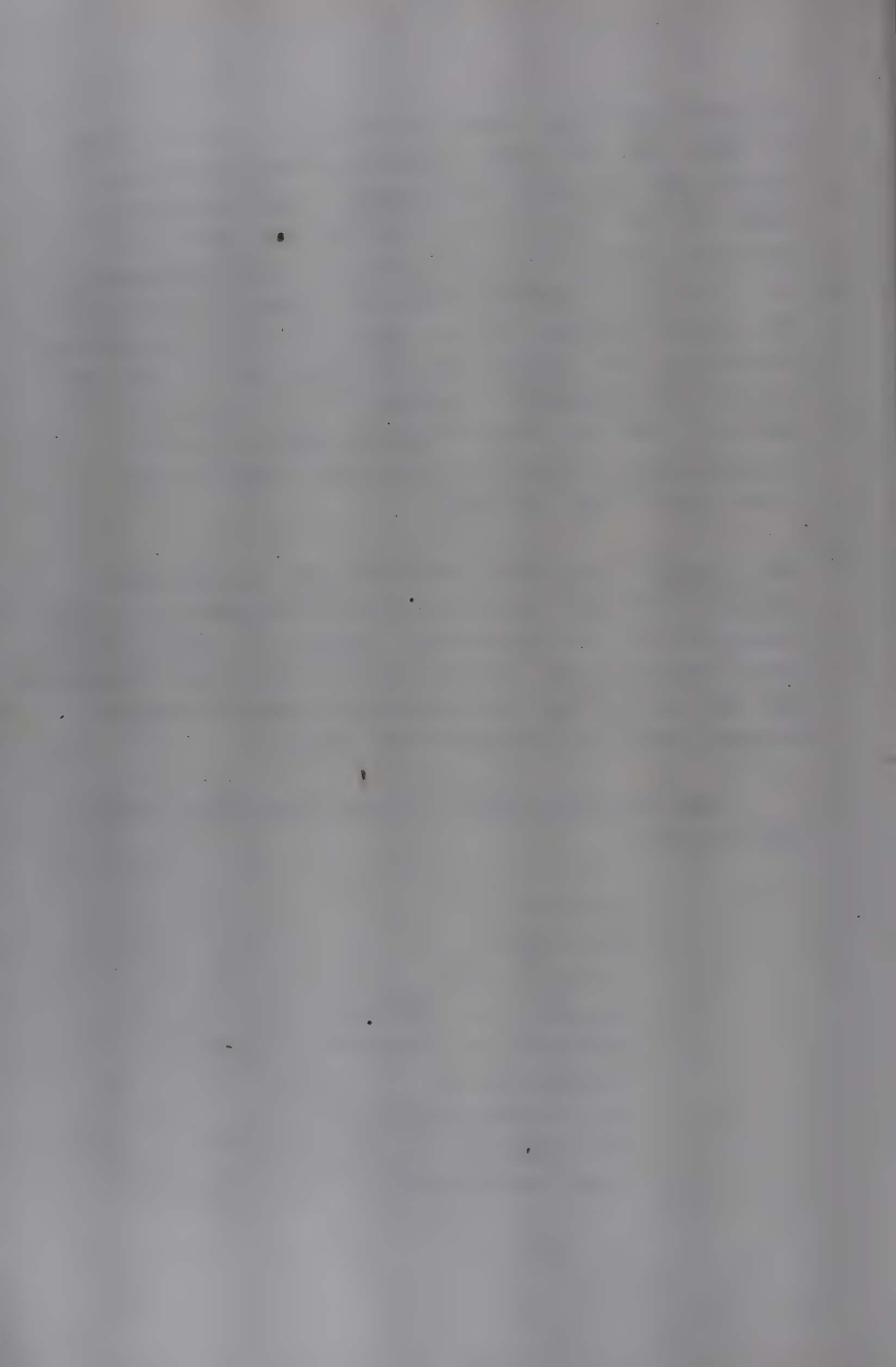
6.3 Organisation: The proposed Polytechnological Clinics will function as one of the constituents of the Complexes with a difference that instead of having links with a

national laboratory, these will function directly under the CSIR, HQ. The Chief, Technology Utilisation will provide the necessary coordination. The Scientists-in-Charge of the Clinics will enjoy the same status and authority as will be done by the Scientists-in-Charge of the constituent Regional Extension Centres on the Campus. They will be Members of the respective Scientific Advisory Committees of the Complex and will also share the responsibility of coordination activity of the Campus by rotation with other Scientists-in-Charge. A chart showing organisational and functional links is given at the end of this Section.

6.4 Staff: Considering the important role of these Clinics, care should be taken from the beginning to staff these properly and adequately. Perhaps, a little scouting within the national laboratories will be useful. Scientists who have inclination and aptitude towards the required activity could be identified and chosen.

The following staff* is tentatively suggested for each Clinic:

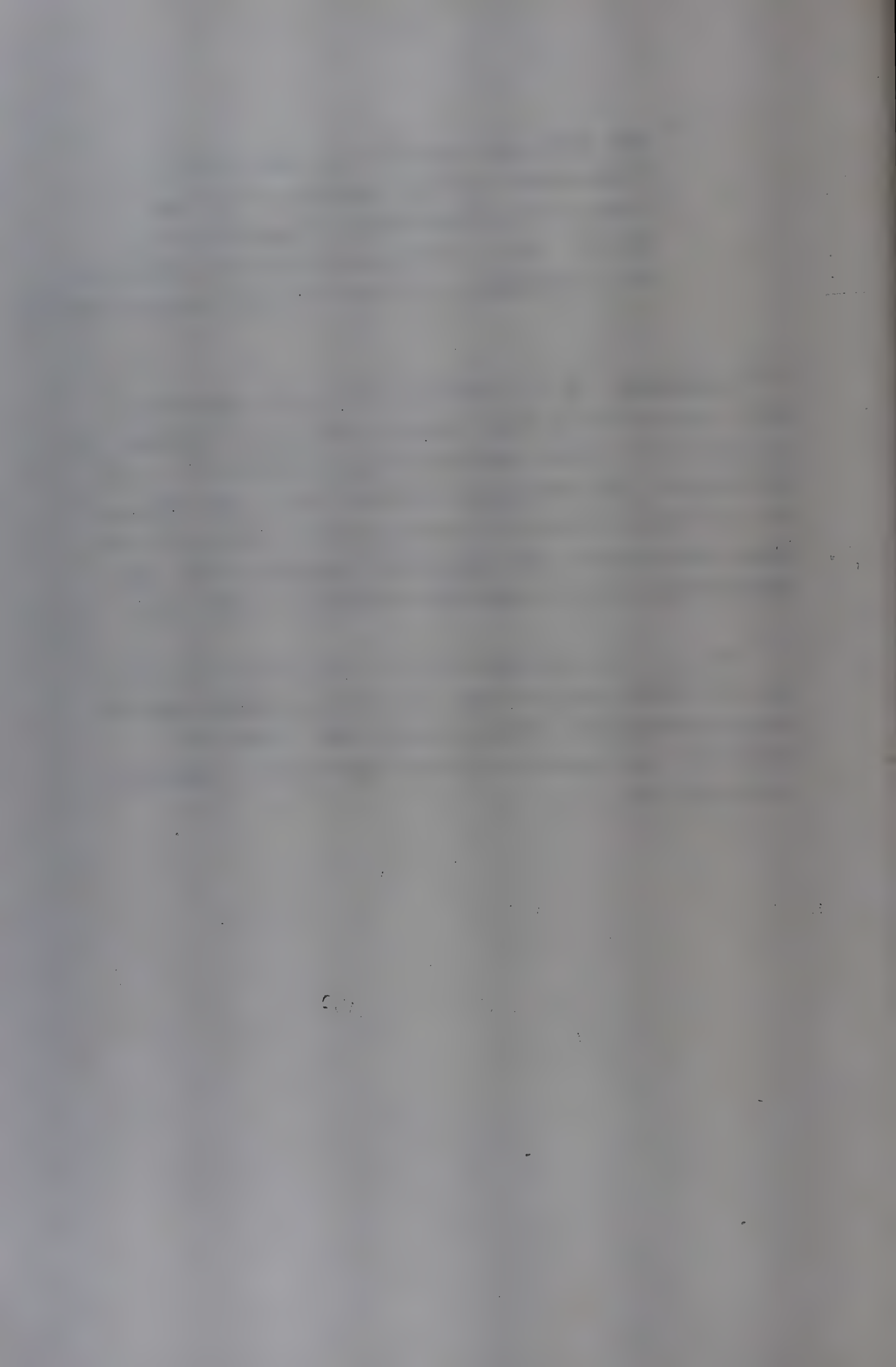
Scientist F	1
Scientist E	5
Scientists C/B	3
Documentation Officer	1
Documentation Assistant	6
Filing Assistant	2
Accounts Assistant	1
Stenos (Pool)	4
House keeping, etc.	5
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* The enlarged functions of the Clinic, as recommended by the Committee, have been taken into account while suggesting the staff. It is visualised that each Scientist will represent different fields of specialisation.

6.5 Funding: It is estimated that each Clinic will have approximately Rs.6 lakhs as its annual budget and will need an office accommodation of 6000 ft². As in the case of the Extension Centres (5.3), the expenses to run these Clinics are expected to be shared by the State Governments (or industry) (Appendix II). The State's share will be directly credited to CSIR, HQ.

It may be mentioned that in the Fifth Five-Year Plan of CSIR, Rs.378 lakhs have been provided for the Polytechnological Clinics and Rs.150 lakhs for Technical Information Centres for various industries (Appendix X).



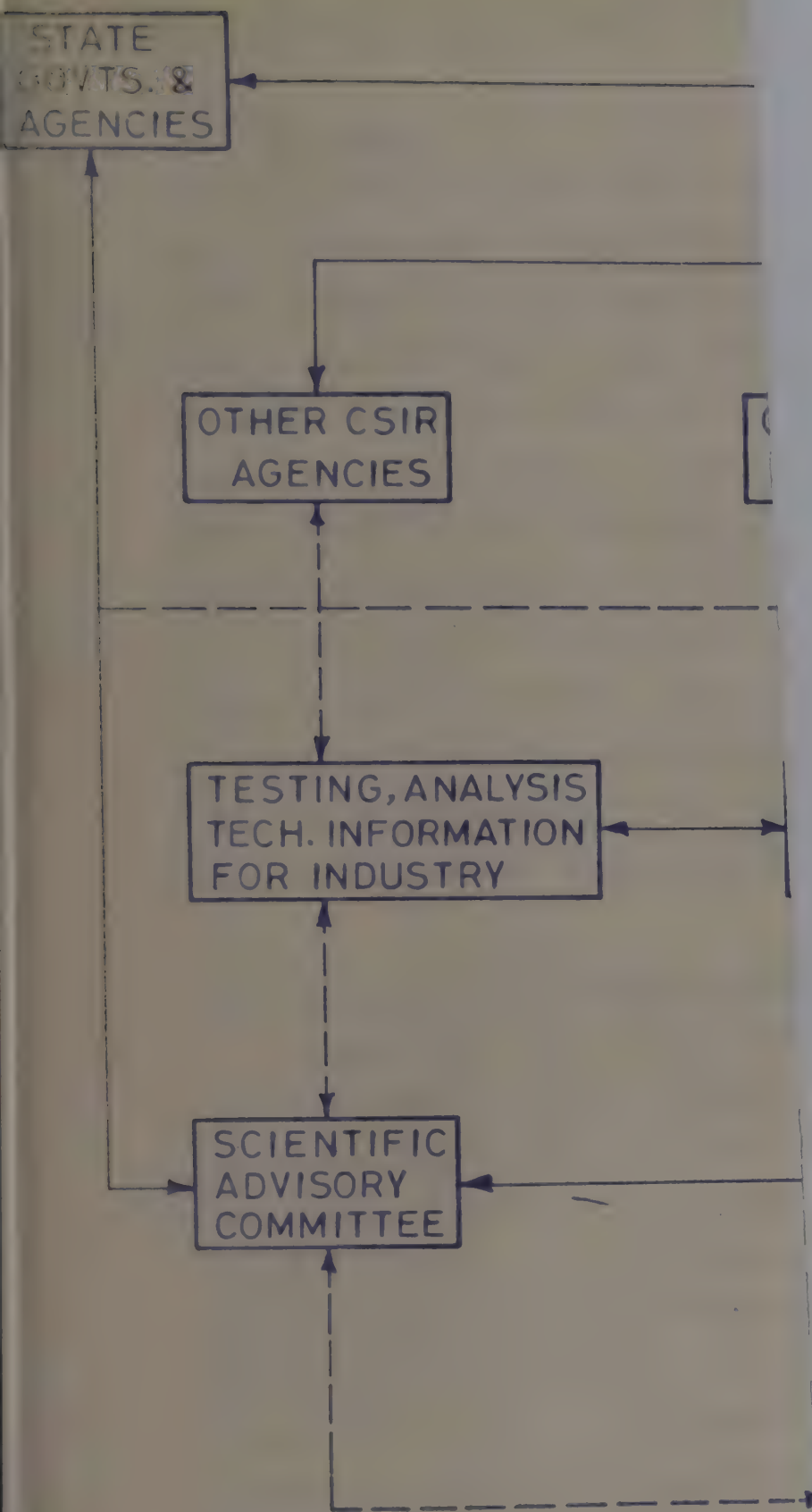


FIG. 2. POLYTECHNOLOGICAL FUNCTIONAL LINKS

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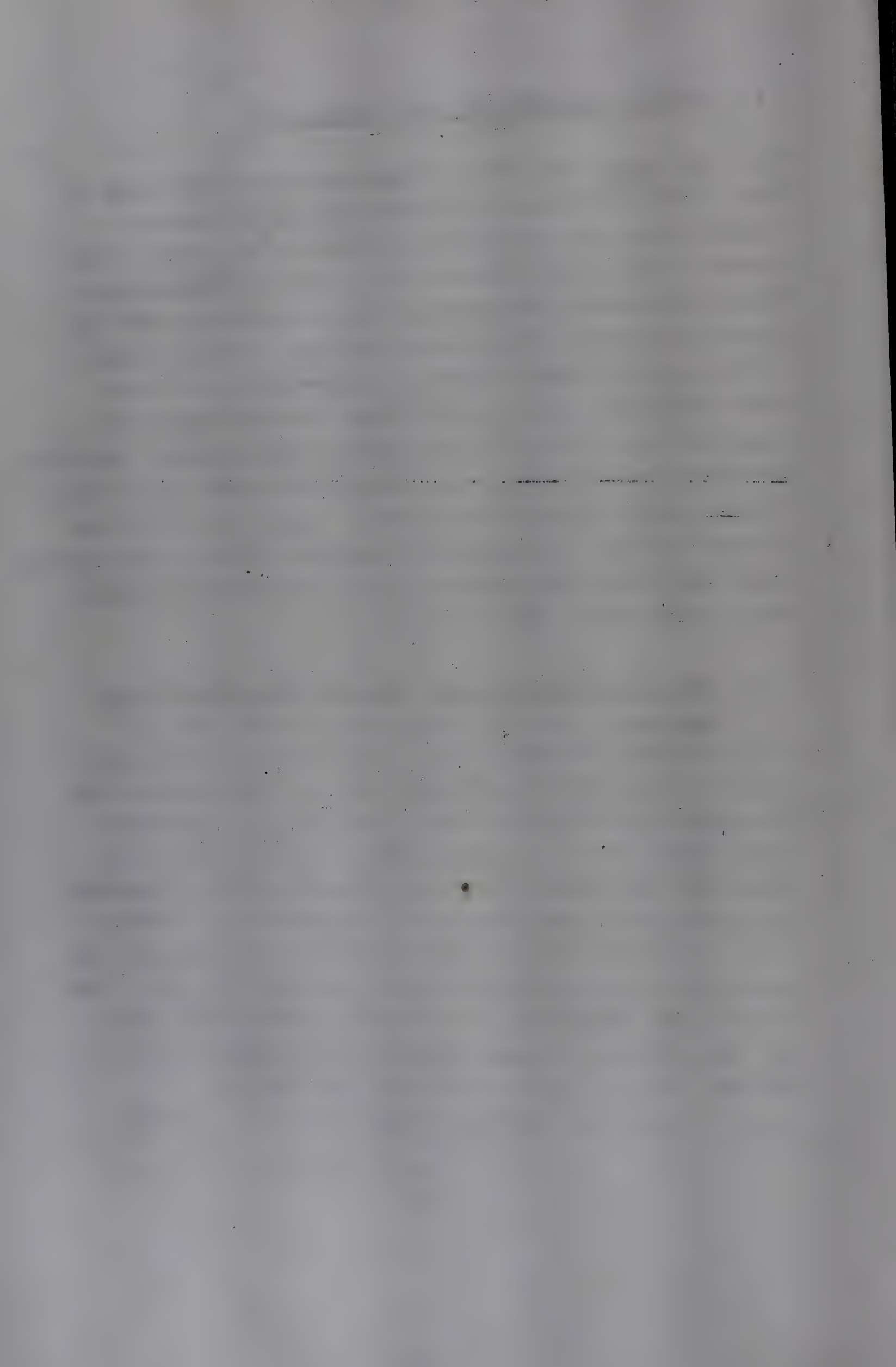
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7. DESIGN, ENGINEERING AND CONSULTANCY

7.1 The need: One of the long-identified weak link in the innovation chain is the inadequacy of design, engineering and consultancy facilities in India, which looms large in the process of transfer of technology. There are several companies, both in public as well as private sectors, which cater for some needs of large-scale and to a small extent, medium-scale projects. Some facilities also exist in the form of design and engineering cells in a few national laboratories and other R & D Centres but these are insufficient and uncoordinated to make any real impression. There is, therefore, a need to have an integrated approach towards establishing new facilities to cover the gap especially for small and medium scale industries.

7.2 Design Development and Research and Consultancy

Centres: The CSIR Guidelines provide for the establishment of the Design, Development and Research Centres (Appendix II, item 6) but the organisation and functions ascribed to these Centres are no different from those of the existing RRL's. Such Centres will not meet the present day requirements and the Committee therefore does not recommend the setting up of these (also see 1.2). The Committee has however accepted the concept of Consultancy Centres (Appendix II, item 7) but feels that their functions should combine with those of the proposed Design and Engineering Units (7.6) **to make the activities cohesive and thus** offer a wider and wholesome service to the clients.



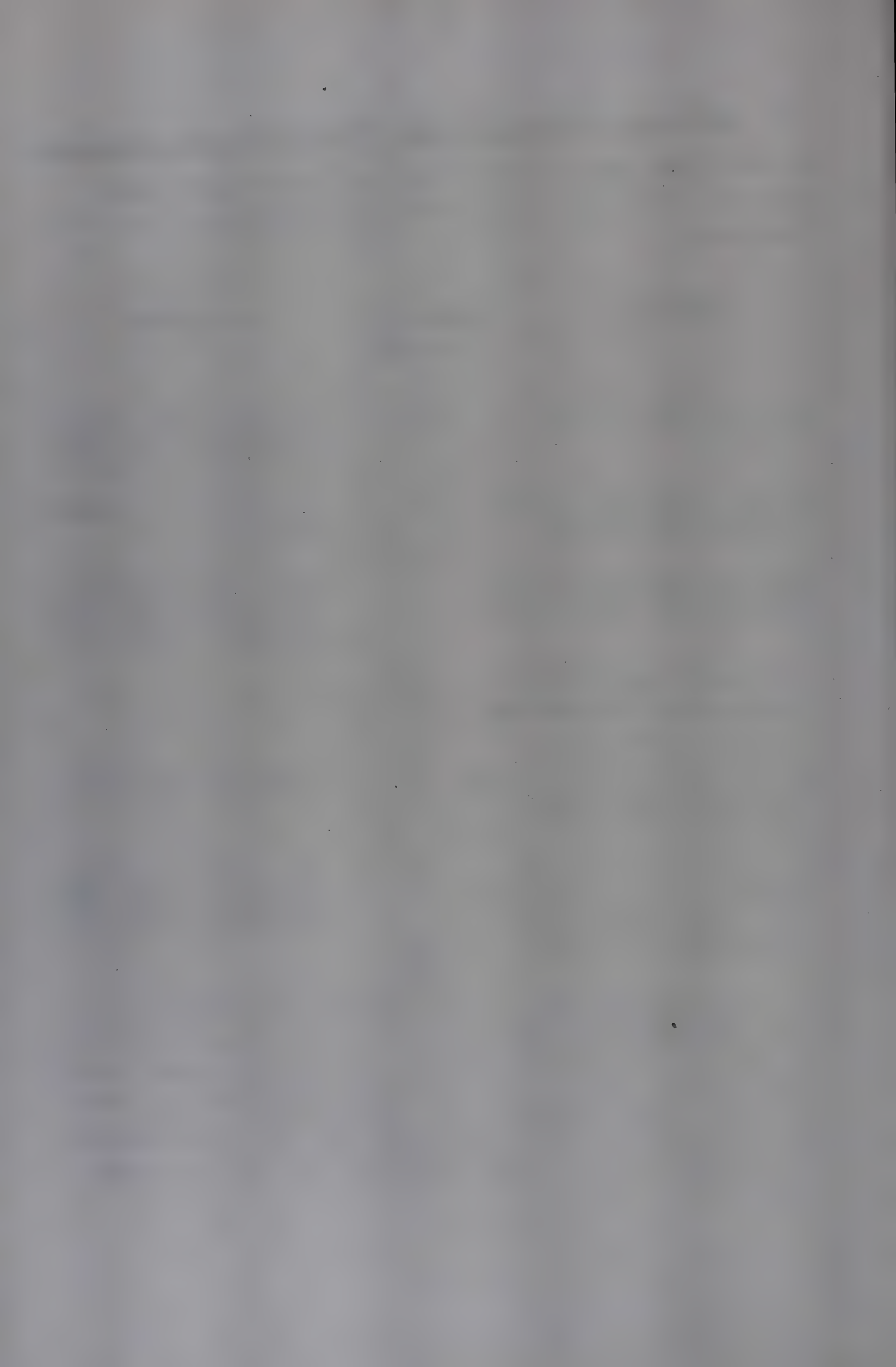
7.3 Proposals included in the CSIR's Fifth Five-Year Plan:

In the Fifth Plan of the CSIR, the following proposals relating to design, engineering and consultancy have been included:

<u>Proposal</u>	<u>Outlay</u> Rs.lakhs	<u>Remarks</u>
Chemical Engineering Centre	182	as part of NCL, Poona; discussed at GB, CSIR meeting of 12.12.1973
Design, Engineering and Consultancy Centre	114	as a Division of CMERI, Durgapur
Engineering, Design and Consultancy Centres for:		No details are given; discussed at GB, CSIR meeting of 12.12.1973
Chemical Engineering	42	
Mechanical Engineering	42	
Civil Engineering	42	
Institute for Agricultural and Agro-Engineering Machinery	42	No details are given
Central Marine Designs Organisation (in association with the Shipping Corporation of India)	100	No details are given; discussed at GB, CSIR meeting of 12.12.1973

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7.4 The NCL Proposal: The NCL proposal visualises a rapid expansion of the activities of the present Chemical Engineering and Process Development Division (CEPD) and to include Bioengineering as an additional field of activity. The reorganised and expanded CEPD will be called Chemical Engineering Centre (CEE) and will cover the following:

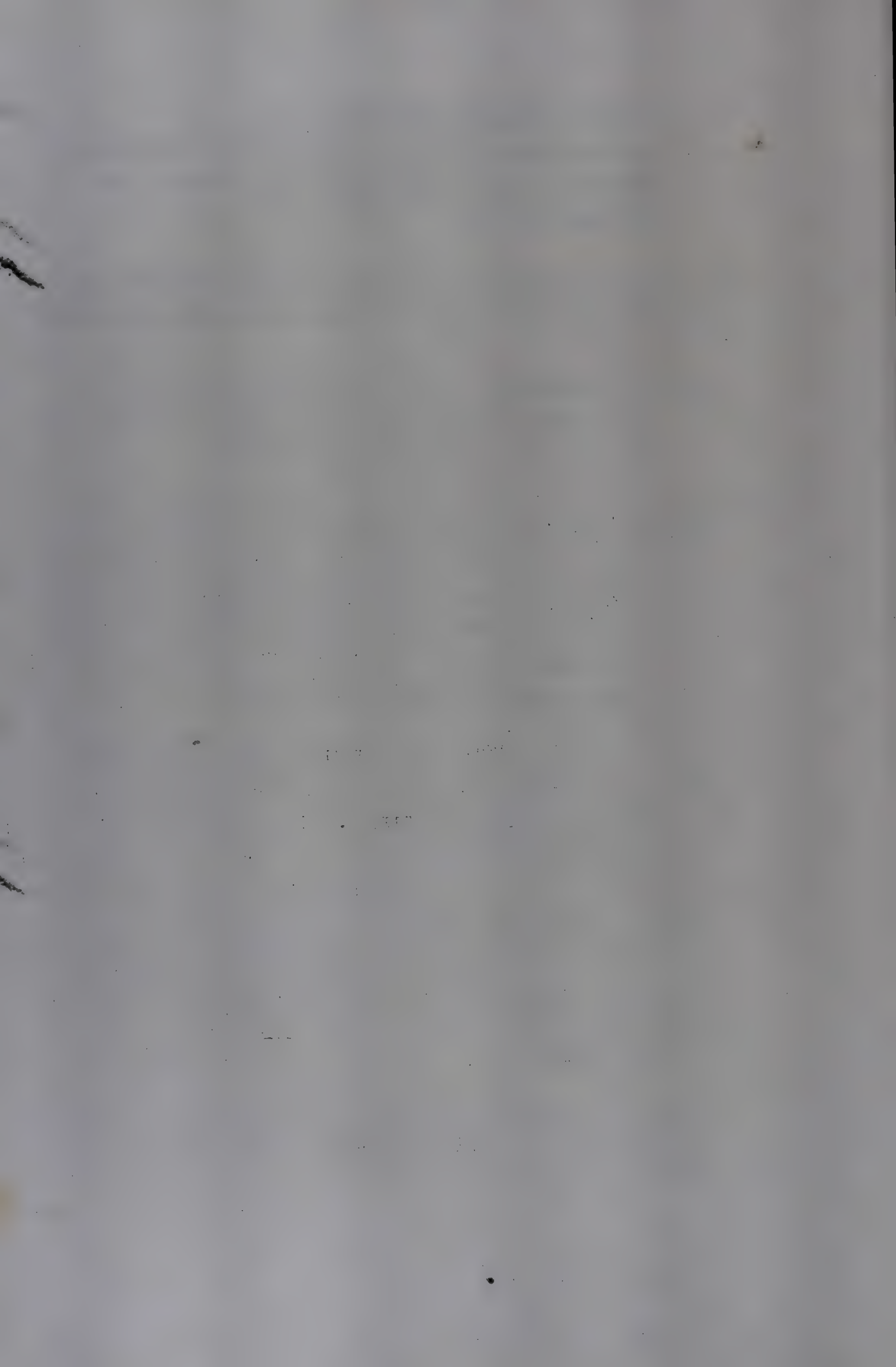


Chemical engineering research,
 Process development and pilot plant evaluation,
 Process design, simulation and control, and
 Bioengineering.

The proposed Centre will assist in the transfer of technology by any one or more of the following procedures:

- (a) by preparing a write-up of the process as developed on the laboratory scale with all the process conditions specified;
- (b) by preparing a write-up of the process based on a reasonable scale of operation (consistent with the ultimate size of the commercial plant) comprising overall material balances for the process, a broad indication of proposed flow-sheet, and consumption figures;
- (c) by preparing a complete process engineering packet consisting of all the information necessary for the project engineering of the process; and
- (d) by offering turn-key job with project engineering details, job responsibilities, etc., but only through a project engineering firm who will give the necessary guarantees to the client.

While the Centre will assist NCL on all the four procedures, it may assist other national laboratories



in (c) and (d). The Centre may also evaluate the high investment pilot plant proposals of other laboratories, if requested to do so. The NCL proposal thus suggests D & E as part and parcel of R & D.

7.5 The CMERI proposal: The proposed Consultancy Division of CMERI will have the following functions:

to assist the entrepreneur and/or CSIR laboratory in the selection and evaluation of a product, a process or a machine;

to prepare technical feasibility/project report to assess the viability of a product/process;

to undertake detailed engineering assignment for the selection of production machinery, manufacturing process, machine lay-out, buildings and shed layout, flowsheet showing process balances and other criterion; and

to advise industry on the utilisation of idle capacity and diversification.

The proposed Consultancy Division will not only make use of facilities available at CMERI, but will also seek assistance in specialised fields from other national laboratories, educational institutions, public sector R & D, private sector consultancy firms and individual experts. In addition, the following additional facilities will be created/extended at CMERI:

Feasibility study and project report



Production engineering know-how
Industrial engineering service

7.6 The Committee's views: The Committee recognises that the design and engineering (and consultancy) activity is closely related to the R & D in various branches of technology (chemical, mechanical, electrical, civil, instruments, etc.) and yet has distinct character and approach of its own. It has to start and develop at a place where infrastructural base has already been created by R & D work but it will grow in an environment of revenue earning commercial activity which is different in some ways from R & D culture with which it will have continuous interplay. Thus it at once suggests the initial location and organisation of this activity. It must begin where infrastructure already exists and it should be, unlike the NCL proposal, organisationally separate from R & D. This fine organisational distinction when viewed in proper perspective becomes important in building bridges which we have failed to build so far, though several attempts have been made to date. The present thrust should, therefore, be to strengthen and expand design and engineering (and consultancy) activity whenever a base exists, make it organisationally separate from and yet allow interaction with R & D and create new bases to build further activity to meet needs of coming times. The Committee visualises that in course of time, these Centres of activity will grow into autonomous or semiautonomous units.

7.7 Recommendations: In the light of the above, the Committee suggests the following:

Chemical engineering: The Committee appreciates and supports the NCL proposal to expand the scope and content of chemical engineering research at NCL, but recommends that the design, engineering and consultancy aspects should be a separate activity ~~though~~ housed in the same campus. The Committee also suggests that similar Centres should also be established at other laboratories where a strong base in design and engineering already exists, e.g. at RRLH and IIP. At RRLH, a design and engineering group has been formed. Its present strength is 29 Scientists and Assistants which will soon be increased to 51. The group functions independent of but in close association with process development groups and also undertakes assignments from outside clients. The current work will yield fees of over Rs.3 lakhs with a prospect of earning another Rs.13-16 lakhs from projects which are under negotiation.

CFTR1

Mechanical engineering: The Committee while supporting CMERI proposal, recommends that the facilities existing at MERADOs and proposed at the new Extension Centres should be expanded in a planned manner to enable each Centre to specialise in the design and engineering requirements of one industry or the other. For example, textile machinery at Ludhiana/Ahmedabad; leather machinery at Lucknow/Madras; ~~farm~~ machinery at Ludhiana/Madras/Poona; paper and pulp machinery at Calcutta, etc.

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Civil engineering: At CBRI and SERC, Roorkee where combined base can be made use of. Besides, computer facilities of SERC and interaction with the university can be made use of to the best advantage of the user of technology.

Electrical engineering: There is no base for this branch of engineering at present. The Fifth Five Year Plan proposals of CSIR (Appendix X) visualises the setting up an Electrical Research and Development Organisation (provision Rs.42 lakhs) and the related Institute for Refrigeration and Airconditioning (provision Rs.42 lakhs). The need for setting up of design and engineering facilities in their fields may be kept in mind where the plans for the new institutes are being considered.

Instruments and electronics engineering: The existing facilities at CSIO, CEERI and NPL may be expanded.

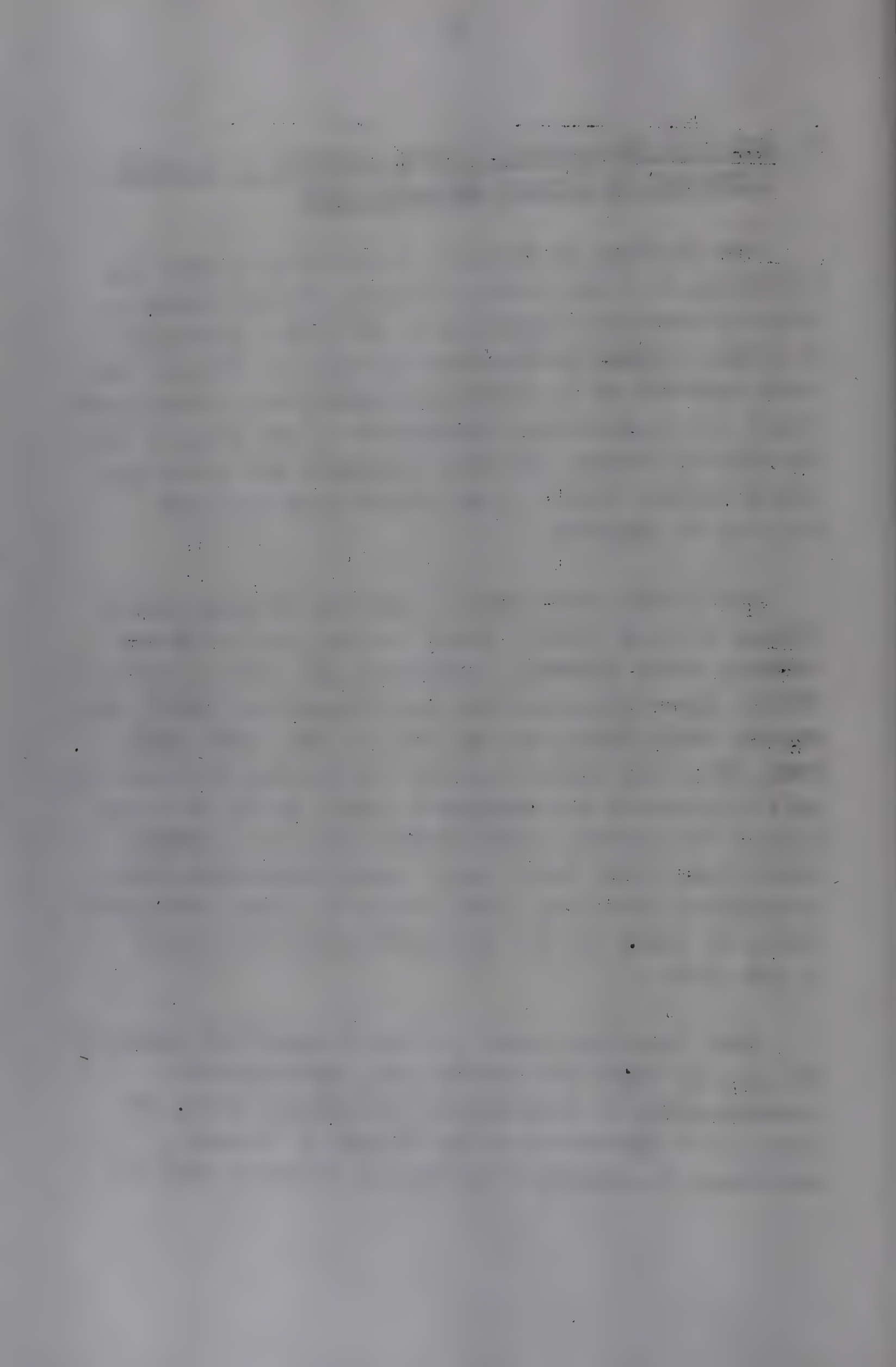
The details will naturally have to be worked out by the CSIR, HQ in consultation with the specialists.

8. REGIONAL DEVELOPMENT THROUGH ADOPTION OF BACKWARD DISTRICTS BY SCIENCE AND TECHNOLOGY

The adoption of backward districts by science and technology is a new concept of all-involving extension activity recently propounded by the CSIR. Karimnagar in Andhra Pradesh is the first district so adopted. The basic approach is to provide scientific and technological inputs for an all-round development of the district with the help of locally available resources and skills and make a visible impact on man around whom the total activity is planned.

The effort will cover development of roads (CRRI), cheaper housing (CBRI), public health, sanitation and drinking water (CPHERI), industrial and other structures (SERC), agro-industries and other industries (CFTRI, NCL, MERADO, RRLH, CIMPO, RRL Jt, RRL Ju, NML, CBRI, CRRI, SERC, CLRI, and others), survey and mapping of resources, land utilisation and management (NGRI, Survey of India, Osmania University), demonstrative education (CPHERI, CLRI, BITM, VITM, ICAR), etc. Coordination with other apex bodies like ICAR, ICMR, Survey of India, Geological Survey of India and the Universities has been sought by the CSIR.

That this experiment is being watched with interest not only in India but outside also, increases the responsibility of CSIR and its constituent units. The focal point of interest is the ability of Project Karimnagar to generate a multiplier effect, so that the



scientific approach to development gets propagated in the district and elsewhere by precept and example.

An important feature of the Project is that the CSIR will not invest any resources other than **its** technical skills (through transfer of technology, extension work, etc.) and the funding will be done by the usual agencies, the financial institutions, development wings of the government, and the entrepreneur. Thus CSIR will, primarily attempt to widen the extent of interaction between science and society and will endeavour to develop man's competence to utilise the available resources to meet his needs.

Thus Project Karimnagar will involve the interplay of several disciplines of science and technology; the devotion of several hundreds of scientists and technologists, extension workers and demonstrators; the participation of administrators, planners and financiers; cooperation and assistance of field workers, students and teachers; and above all, convincing of man for whom the Project is designed.

The Committee does not wish to make any comments regarding the organisation required to successfully perform the tasks, as the CSIR is reviewing the problem at an appropriate level but would only suggest that the proposed organisation should match with the character and enormity of work involved. It should be efficient; should be able to enthuse scientists and the users alike; and should project correct image of CSIR.

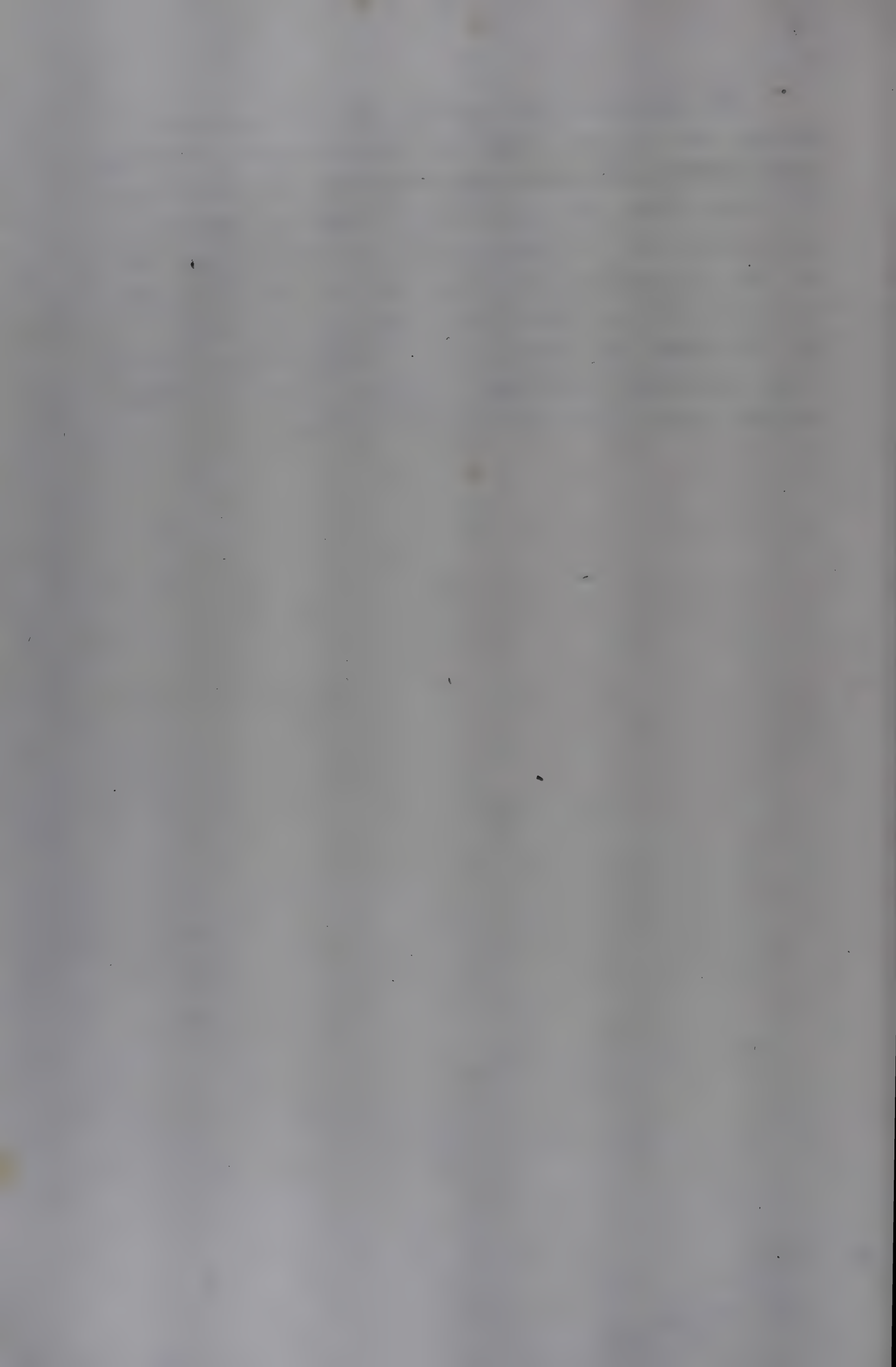
9. PROPOSALS OF INFORMATION SCIENCES GROUP

There are several proposals in the CSIR's Fifth Five Year Plan (Tables 8 and 9) in the nature of expansion of existing facilities or establishment of new facilities made by the Information Sciences Group. These are:

Proposal	<u>Rs.in lakhs</u>
Additional galleries and central exhibition unit at BITM	72
Additional galleries at VITM	10
Industrial and Technological Museum at Bombay	103
Industrial and Technological Museum at Delhi	103
National Science Library, Delhi	225
National Science Press, Delhi	271
National Technological Information System, Delhi (including computer)	458
Photocomposing Unit, Delhi	21
International Consultancy Bureau	42
Science-based Industrial Parks	50
Nucleus for the study of science, technology and development	12
Dissemination of science and technology in Indian languages	75
Market research cell	12



The Committee has already stressed at several places the need to close the communication gap between the scientist and the user of science and technology. It, therefore, welcomes all proposals for generation, documentation and dissemination of information. Most of the proposed activity is, however, located in or around CSIR HQ. Some activities have obviously to be in Delhi but others like dissemination or science and technology in Indian languages can well be placed in the areas of the language concerned.

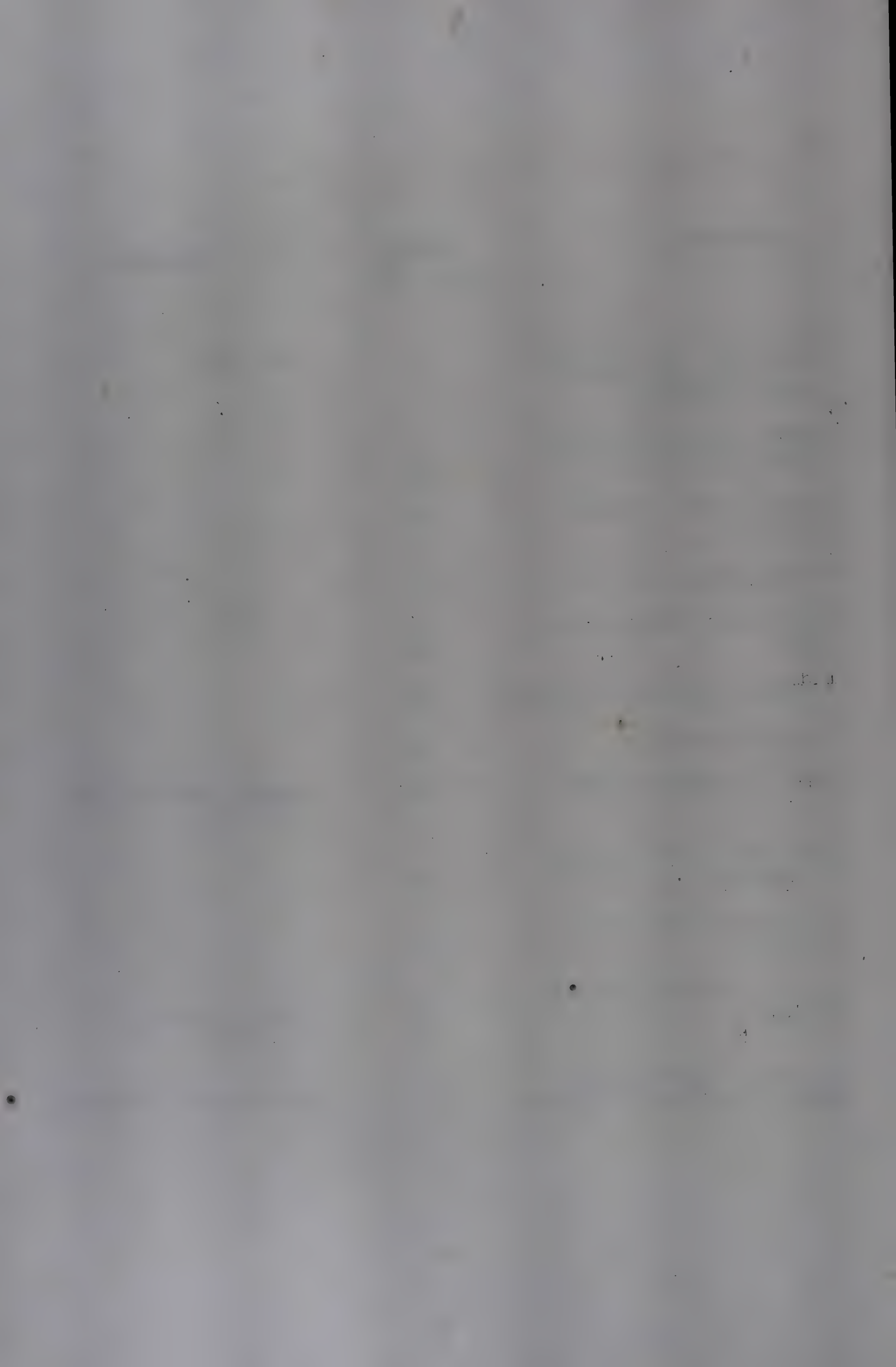


10. PROPOSALS FOR NEW INSTITUTES

The proposals for establishing new institutes under the Fifth Five Year Plan of CSIR are given in Appendix (X). Some areas like R & D on new sources of energy recently received have added importance. It is not within the purview of this Committee to make comments or give suggestions on these proposals but they are listed below to present a total perspective of CSIR network. Some remarks are, however, included to draw attention on specific items.

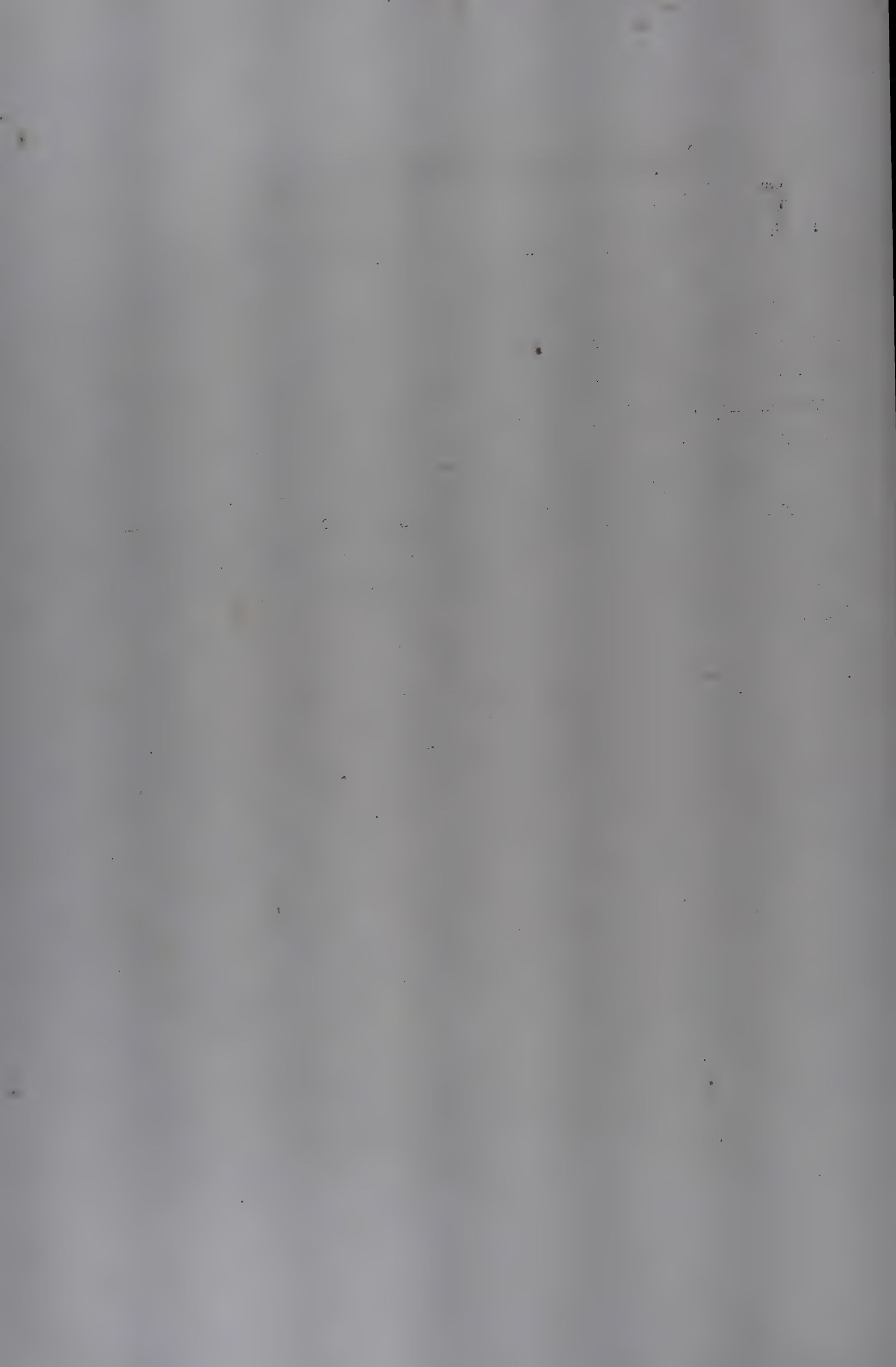
<u>Proposal</u>	<u>Input</u> Rs. lakhs	<u>Remarks</u>
Central Research Institute for Paper and Pulp Technology	42	Under consideration of CSIR
Institute for Fermentation Research and Engineering	42	Cf. Proposals of CFTRI and CDRI (3.4)
Institute for Refrigeration and Air conditioning	42	See 7.7
Electrical Research and Development Organisation	42	See 7.7; BHEL have also set up a R & D Centre at Hyderabad
Corrosion Research	63	Cf. NML and CECRI proposals (3.4)
Fibre Research Laboratory	42	SASMIRA, ATIRA, IJRA, etc. already involved
Flyash Research	30	CBRI, SERC already involved

<u>Proposal</u>	<u>Inputs</u> Rs.lakhs	<u>Remarks</u>
Institute for Agricultural and Agro-Engineering Machinery	42	See 7.3
Centre for Training of Laboratory Technicians	42	
Centres for catalyst Research	42	
Solar Energy Research	21	
Aluminium Institute of India	42	
Welding Research Institute	42	
Polymer Research	42	
R & D on Refractories	42	CGCRI, NML already involved
Research on New Types of Engines	72	
Biological Research Centres	63	
Optical Glass Research Centre	75	CGCRI already involved
National Non-Ferrous Metals Research Institute	80	NML already involved



11. INTERIM ACTION TAKEN BY THE COMMITTEE

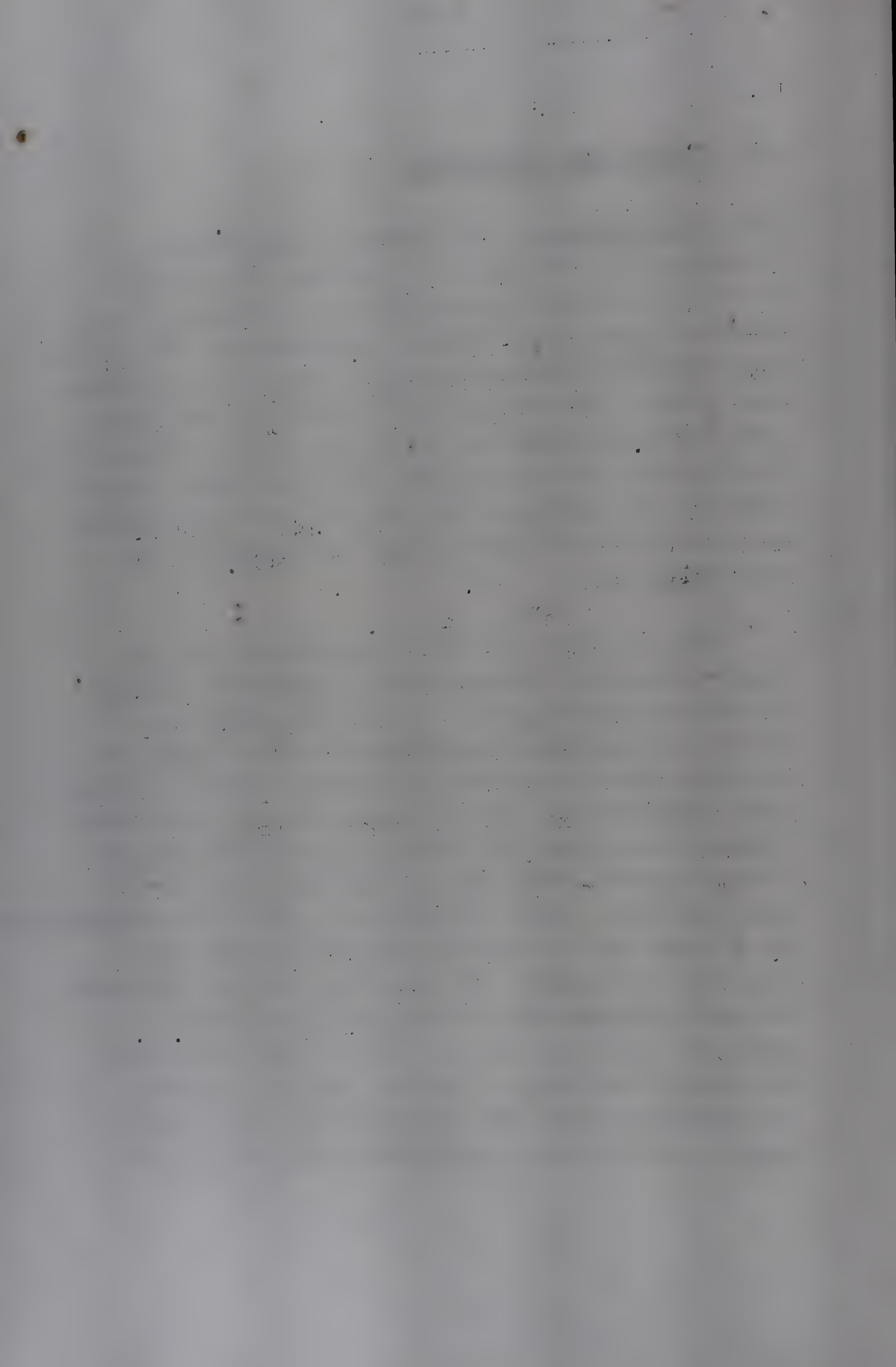
While this Report was being written, the Committee made some interim recommendations to permit advance action on items which required discussions with the State Governments. These related to the request of the Rajasthan Government to set up a CLRI Extension Centre at Kota (Appendix IV), the request of the Punjab Government to establish a Regional Testing and Development Laboratory (Appendix XII) and suggestions regarding setting up of Polytechnological Clinics and Service Centres at various locations in the country (Appendix XI). These recommendations have been suitably incorporated in the Report.



12. SUMMARY AND CONCLUSIONS

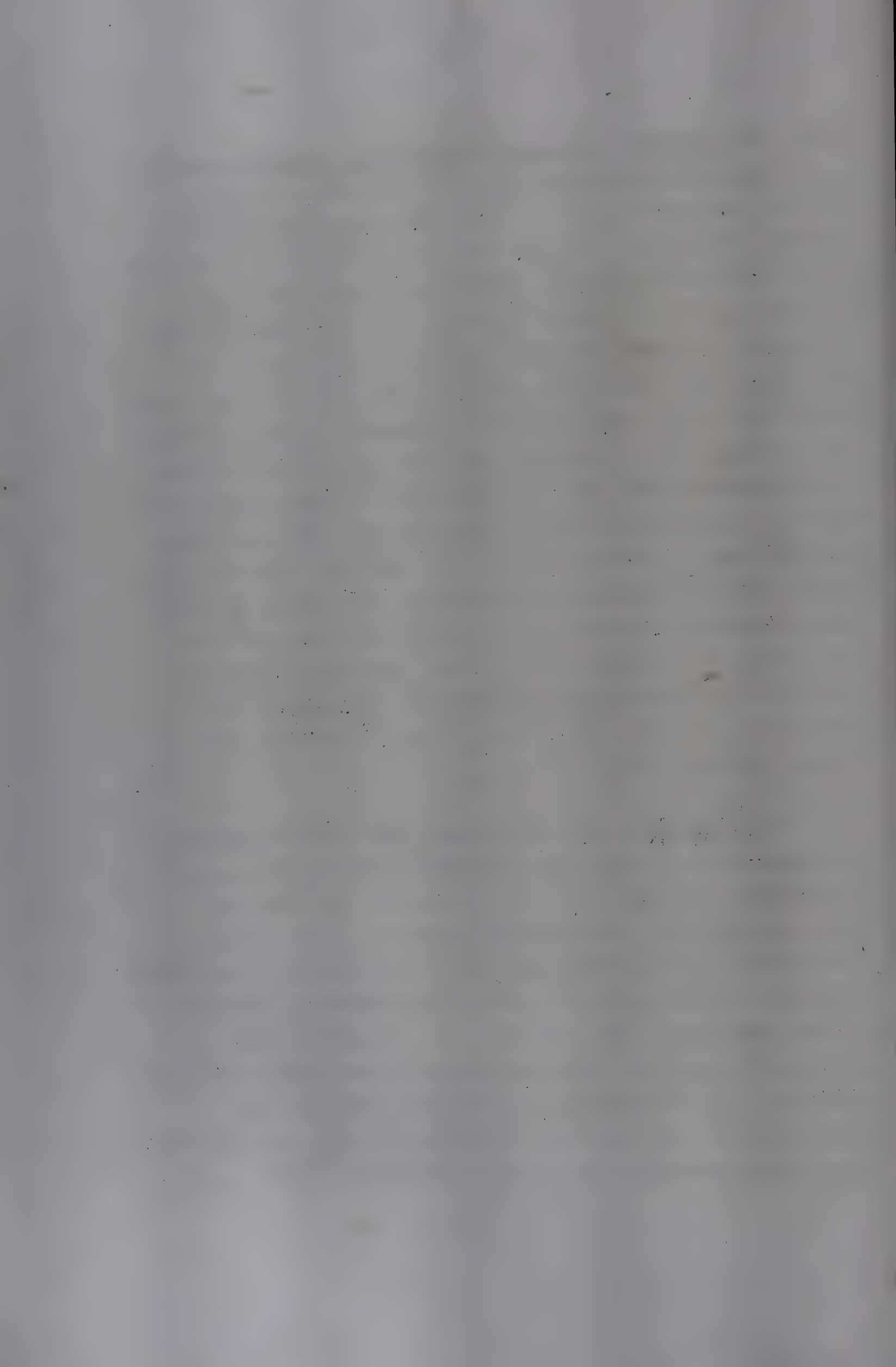
12.1 The approach: The Committee, appointed in February, 1973, was asked to consider the requests received from the various States for setting up R & D Centres to assist the regional development. It studied the available information on the resources and development plans of the States (1.5), identified development gaps (1.6), examined the total R & D set-up in India (2), particularly that of the CSIR (2.3) and made a special study of the working of the Regional Extension Centres and their potential role in the development of the regions (3).

This exercise convinced the Committee that no single laboratory, however large, can assist a region in its development plans. On the other hand, it revealed a significant emerging pattern of accent on regional extension activity in several areas of development represented by the multi-disciplinary constituent laboratories of the CSIR which with suitable changes (both in organisation and in objectives) and with some additions, could effectively be geared to serve/suggested as an instrument of national progress through the regional development. The Committee has also recommended some complementary and supplementary measures which not only cater for the needs of the States but fit into the pattern of national goals. In making its recommendations, the Committee has always kept focus on the ultimate beneficiary - the user (1.7).



12.2 The Regional Extension Centres as instruments of regional development: The Regional Extension Centres of specialised laboratories have a mandate to render service in the area of their location. They also have the backing of the specialised knowledge and facilities of the parent institutes. If the Centres of several specialised Laboratories are located in one area, the region can derive benefits of specialised knowledge in as many fields. Further, if the Centres are located on one Campus, the spectrum of knowledge to be communicated to the user gets further multiplied due to interdisciplinary interactions. The principal gain of such a set-up will be to the user who will now have a multidisciplinary advice and service. Several such Complexes located in the different regions of the country can thus become vehicles through which CSIR can provide multidisciplinary assistance and effectively contribute towards the development of these regions (4.3).

The Committee is suggesting the establishment of Complexes not merely for administrative or financial advantages but has carefully analysed the present day situation and the related needs. It has been attempted to transform isolated and single-disciplinary activity into a group and multidisciplinary activity. It has projected the concept in a concrete form by inter-relating the multidisciplinary extension activity with R & D, information and service activity and presented it as a package activity for the development of a region to meet the challenge of the



situation. In this context, other suggestions of the Committee form integral part of a total attack for an solution of developmental problem (5.4).

12.3 Organisation and management aspects (5): The character (4.1) and functions and objectives (4.2) of the Regional Extension Centres/Complexes have been described. To perform these tasks, the Regional Extension Centres must necessarily be made semi-autonomous by delegating more powers to the Scientists-in-Charge and yet maintaining professional, intellectual, personal and some necessary administrative links with the parent laboratory. It is also necessary to have direct organisational links of a Complex with CSIR, HQ (to cater for the infrastructural needs and for planning and coordination) and with the State Government(s) and the user industry (Fig.1, p.47).

A Regional Extension Centre should be headed by a Scientist E/F with financial powers of a Scientist F. Within the Centre, he will have the authority to allot work and sanction leave and tour programmes but will refer to parent laboratory all matters relating to transfers, disciplinary action, etc. Within the scope and facilities of the Centre, he will have freedom to allot priorities to work, undertake new work, take decisions on interdisciplinary collaboration with other Centres/local R & D Centres, fix fees for sponsored work and consultancy and other services (as per relevant guidelines) but will periodically report to his parent laboratory all such actions taken (5.2).



If a Regional Extension Centre is a part of a Complex, its Scientist-in-Charge will be a member of the Scientific Advisory Committee of the Complex and will by rotation function as a Coordinator of the Complex. As a Coordinator, he will be required to perform functional tasks of planning and executing infrastructural needs of the Complex, preside over periodic meetings of the Coordination Committee (comprising all Scientists-in-Charge of the constituent Centres, Administrative Officer, Accounts Officer), and will generally coordinate the activity of the Complex (5.2).

The Scientific Advisory Committee of a Complex will be presided over by a Scientist/Technologist nominated by the CSIR in consultation with the State Government and the Coordinator will be its Secretary. Other members of the Committee will be:

Scientists-in-Charge of the constituent Centres

Two nominees of the State Government or one each from each State if more than one State **is** involved

Two representatives of the user industries

Scientist-in-Charge of the Polytechnological Clinic located in the State

Scientist-in-Charge of the Coordination Cell at CSIR, HQ or any other nominee of DG SIR

Administrative Officer

Accounts Officer

The notice of a meeting of the Advisory Committee will be sent well in advance (say, 3 weeks ahead) and the Directors of the parent laboratories will also be invited to attend. In their absence, Scientists-in-Charge of the Centres will have the authority to take decisions involving commitment of the parent laboratories.

The functions of the Scientific Advisory Committee of the Complex will be:

to review and recommend the infrastructural needs of the Complex

to review the progress of work, examine any new programmes and to suggest overall priorities

to review and make recommendation on schedule of charges for testing and analysis (5.2)

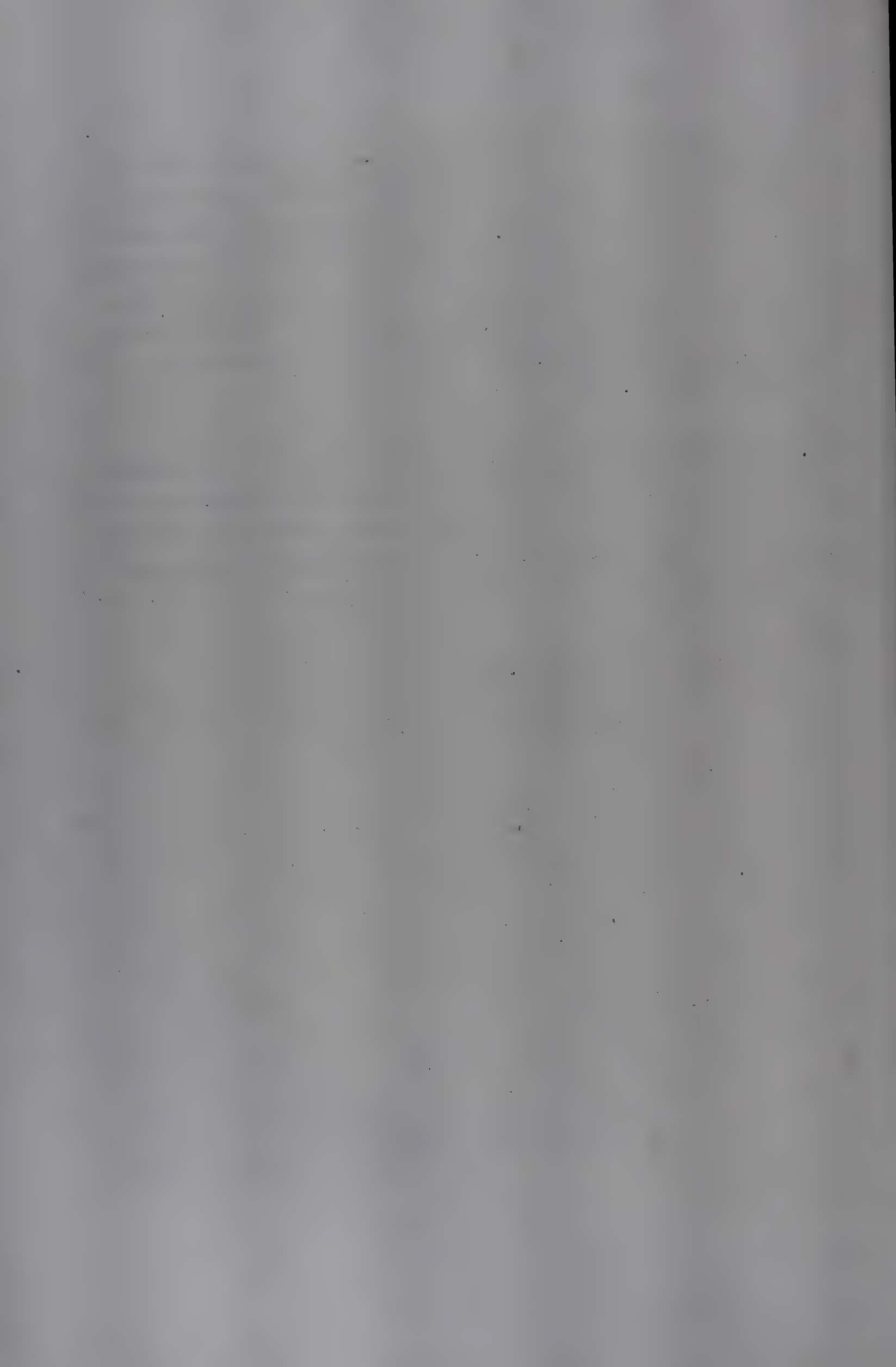
12.4 Funding: Since the Regional Extension Centres/Complexes are being proposed as the major instrument through which CSIR will contribute towards the regional development, it is suggested that the expenditure on these Centres/Complexes must be shared by the region. The total outlay of new Centres proposed in the CSIR's V Plan is of the order of Rs.11 crores. This does not include expenditure on the activity at the existing



48 Centres. The regional share (contributed by the regional industry, the State Governments or both) may be sent directly to CSIR, HQ by the State Governments of the region. The details of quantum of share could be discussed with the respective State Governments. A 50:50 financial participation on the lines of the Cooperative Research Associations is tentatively suggested (5.3).

12.5 The likely Campuses: Table 2 (3.4) highlights several places located in different regions which will soon have a high concentration of extension activity in various disciplines as represented by different laboratories of the CSIR. These are:

Hyderabad (A.P.)
 Jorhat (Assam)
 Patna (Bihar)
 Delhi
 Ahmedabad (Gujarat)
 Jammu (J & K)
 Bangalore (Karnataka)
 Trivandrum (Kerala)
 Bhopal (M.P.)
 Bombay (Maharashtra)
 Ludhiana (Punjab)
 Jaipur (Rajasthan)
 Madras (Tamil Nadu)
 Kanpur (U.P.)
 Calcutta (West Bengal)



These locations are therefore suggested for the establishment of the proposed CSIR Complexes. The Committee has also proposed the setting up of some new Regional Extension Centres (5.4).

12.6 Polytechnological Clinics: The Polytechnological Clinics are designed as yet another step towards establishing these communication links. These Clinics "are in the nature of diagnostic, information and direction centres for group of industries in a particular area or region. Their capability will consist not so much in problem solving but in being able to understand the problem and direct the industrial firm to source where its problem could be tackled within or outside CSIR. These could be useful links with the Directors of Industries of the States, small and medium scale industries, and the SISIs, IITs and the universities on one hand and CSIR Laboratories on the other" (CSIR Guidelines, see Appendix II).

The Committee feels that the scope of these Clinics should be enlarged to include, where possible, the functions of the Technical Information Centres for various industries proposed to be established during the V Plan Period. The Clinics should also be adequately equipped with information to direct the users to an appropriate agency for testing and analytical assistance. In this way, the Polytechnological Clinics can be made the regional focal points of information and technology transfer and also help in building interlaboratory and interdisciplinary bridges.

Since the Polytechnological Clinics will be required to function as information collection and dissemination centres with ramification of links with the State Governments, their agencies, industry, national laboratories and other R & D Centres, it will be advantageous to locate these on the proposed campuses of the Regional Extension Centres (5.4). A majority of these Clinics will thus be situated in the capitals of the States which will be an added advantage in their functioning. Additional Clinics could be established in the uncovered areas. Thus, the Polytechnological Clinics are, therefore, suggested to be located at: Hyderabad, Jorhat, Patna, Delhi, Ahmedabad, Jammu, Bangalore, Trivandrum, Bhopal, Bombay, Ludhiana, Jaipur, Madras, Kanpur, Calcutta, Chandigarh and Imphal (or any other more suitable location). The Chandigarh Clinic will serve Haryana and Himāchal Pradesh, while Jorhat and Imphal (or its alternative) will cater for all the States in the region.

The proposed Polytechnological Clinics will function as one of the constituents of the Complexes with / difference that instead of having links with a /the national laboratory, these will function directly under the CSIR, HQ. The Chief, Technology Utilisation will provide the necessary coordination. The Scientists-in-Charge of the Clinics will enjoy the same status and authority as will be done by the Scientists-in-Charge of the constituent Regional Extension Centres on the Campus. They will be Members of the respective Scientific Advisory Committees of the Complex and will also

share the responsibility of coordination activity of the Campus by rotation with other Scientists-in-Charge.

Considering the important role of these Clinics, care should be taken from the beginning to staff these properly and adequately. Perhaps, a little scouting within the national laboratories will be useful. Scientists who have inclination and aptitude towards the required activity could be identified and chosen.

It is estimated that each Clinic will have approximately Rs.6 lakhs as its annual budget and will need an office accommodation of 6000 ft². As in the case of the Extension Centres (5.3), the expenses to run these Clinics are expected to be shared by the State Governments (or industry) (Appendix II). The State's share will be directly credited to CSIR, HQ.

It may be mentioned that in the Fifth Five-Year Plan of CSIR, Rs.378 lakhs have been provided for the Polytechnological Clinics and Rs.150 lakhs for Technical Information Centres for various industries (Appendix X).

12.7 Design, engineering and consultancy: There is a long-felt need to have an integrated approach towards establishing new facilities or strengthening the existing ones in the field of design, engineering and consultancy to reinforce this weak link in the innovation chain. There are several proposals included in the V Five-Year Plan of CSIR with a total outlay of

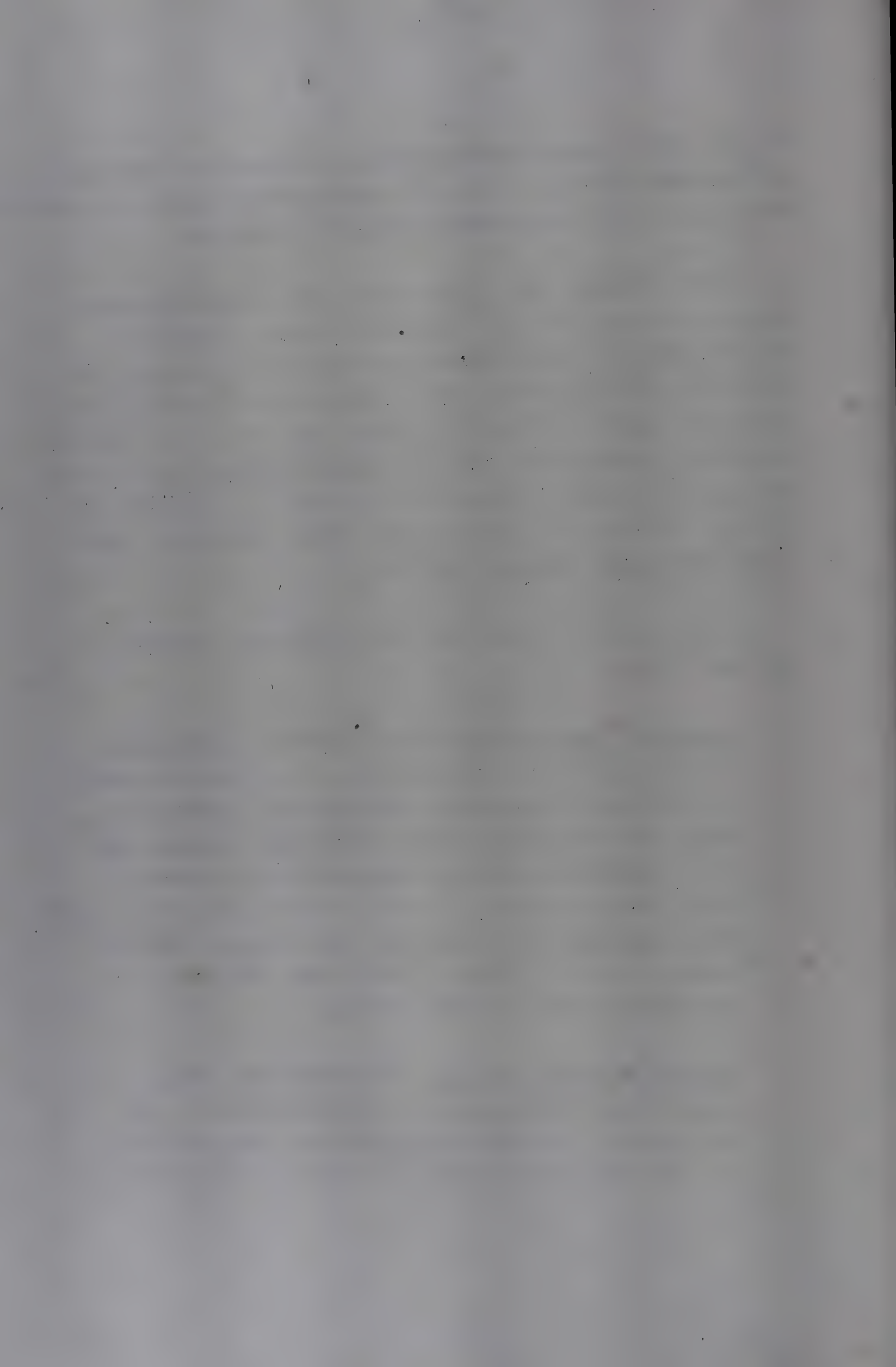
Rs.564 (7.3). Some of the proposals were also discussed at the 60th Meeting of the Governing Body of CSIR (12.12.73). These have also been studied by the Committee.

The Committee is of the view that semi-autonomous design, engineering and consultancy units should be started where a base already exists while creating new bases for future needs. These units will be organisationally separate from R & D, but will have scope for the desirable interaction with R & D and information set-up. (Cf. NCL proposal). Their activity will be commercial, revenue earning. In due course, these units will grow into autonomous Centres (7.6).

The Committee has made the following recommendations (7.7).

Chemical engineering: The Committee appreciates and supports the NCL proposal to expand the scope and content of chemical engineering research at NCL, but recommends that the design, engineering and consultancy aspects should form a separate unit though remaining closely related to R & D (7.6). The Committee also suggests that similar centres should also be formed at RRLH and IIP where sufficient base already exists.

Mechanical engineering: The Committee while supporting CMERI proposal, recommends that the facilities existing at MERADOs and proposed at the new Extension Centres should be expanded in a



planned manner to enable each Centre to specialise in the design and engineering requirements of one industry or the other. For example, textile machinery at Ludhiana/Ahmedabad; Leather machinery at Lucknow/Madras; farm machinery at Ludhiana/Madras/Poona; paper and pulp machinery at Calcutta, etc.

Civil engineering: At CBRI and SERC, Roorkee where combined base can be made use of. Besides, computer facilities of SERC and interaction with the university can be made use of to the best advantage of the user of technology.

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Instruments and electronics engineering: The existing facilities at CSIO, CEERI and NPL may be expanded.

The details will naturally have to be worked out by the CSIR, HQ in consultation with the specialists.

12.8 Other suggestions:

12.8.1 Sufficient infrastructure exists in the universities, government agencies and elsewhere in India for undertaking commercial testing and analysis.

It is suggested that the CSIR should take a lead in compiling this information on a national scale and present it regionwise for the benefit of the user.

12.8.2 It will be desirable to create facilities for upscaling and downscaling of processes, where possible, to promote self-employment of technical people (1.6).

12.8.3 It will build a better image of the CSIR if the general technical consultancy cells are in all national laboratories and their extension centres to provide a well-coordinated service to the user (1.6).

12.8.4 A passing reference has been made to other important activities of the CSIR designed to accelerate national/regional progress (8,9,10). The Committee generally supports these proposals which are in nature complementary to its own suggestions.

12.9 CSIR network: A total picture of CSIR network incorporating the recommendations of the Committee is shown in Table 3. The organisational and functional links are indicated in Fig.3 at the end of this Section.

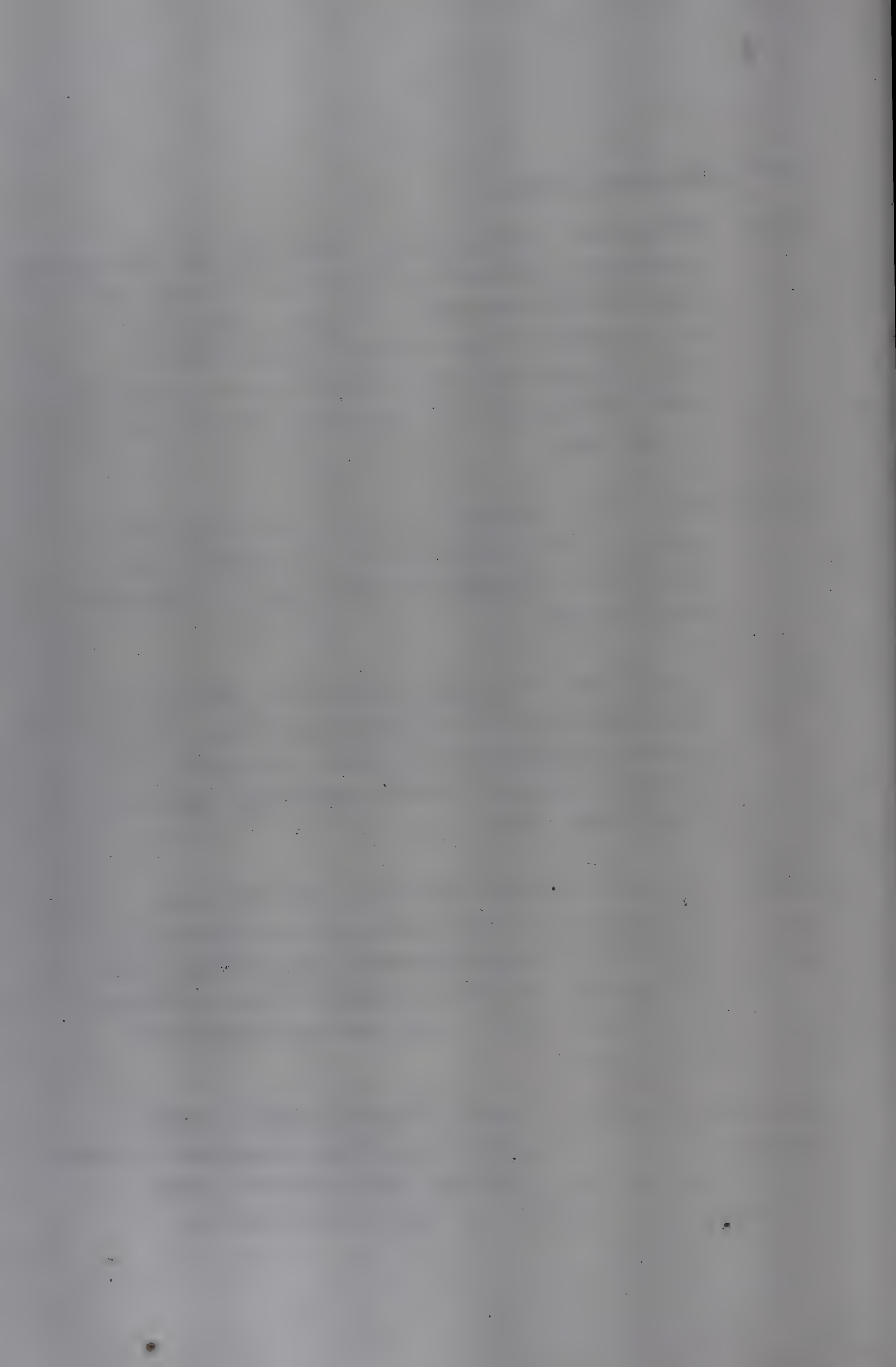


Table 3CSIR NETWORK

(incorporating the suggestions
made by the Committee)

REC - Regional Extension Centre

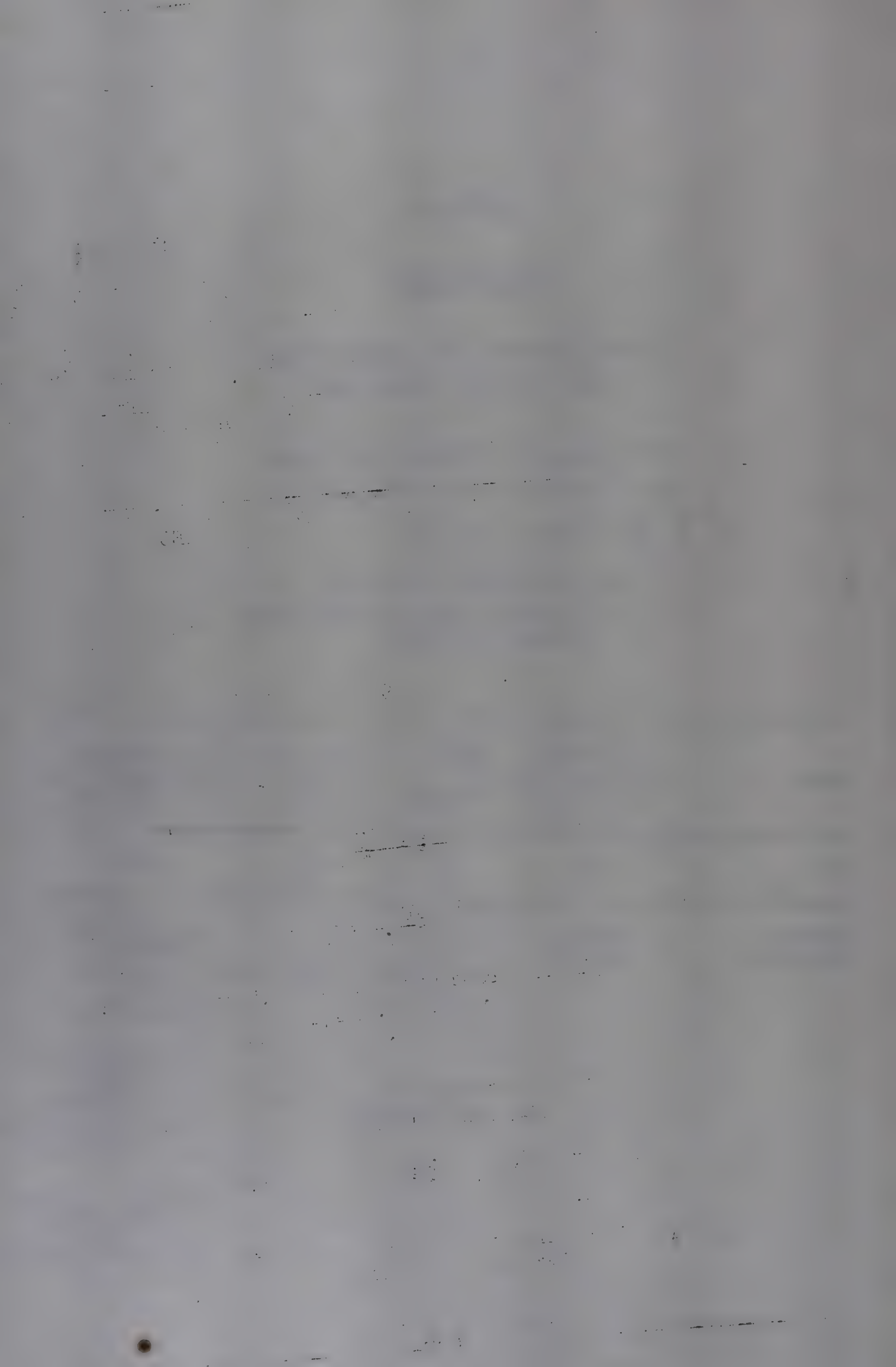
PC - Polytechnological Clinic

[] - shows a Complex

? - alternative location

* - involves shifting from its
present location

Area	National/ Cooperative Res. Lab.	REC PC Complex	Location of the Complex	New extension activity at the Lab./CSIR, HQ
(1)	(2)	(3)	(4)	(5)
Andhra Pradesh	NGRI RRL(H)	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> CFTRI CPHERI CSIO(S&M) CSIO(Trg.) CRRI PC </div>	Hyderabad	NGRI, Hyderabad Airborne, Geophysical Surveys; Groundwater Surveys; Production of Geophysical Instruments; Technical Infor- mation Centre <u>RRLH</u> Design, enginee- ring and con- sultancy (chemical industry).



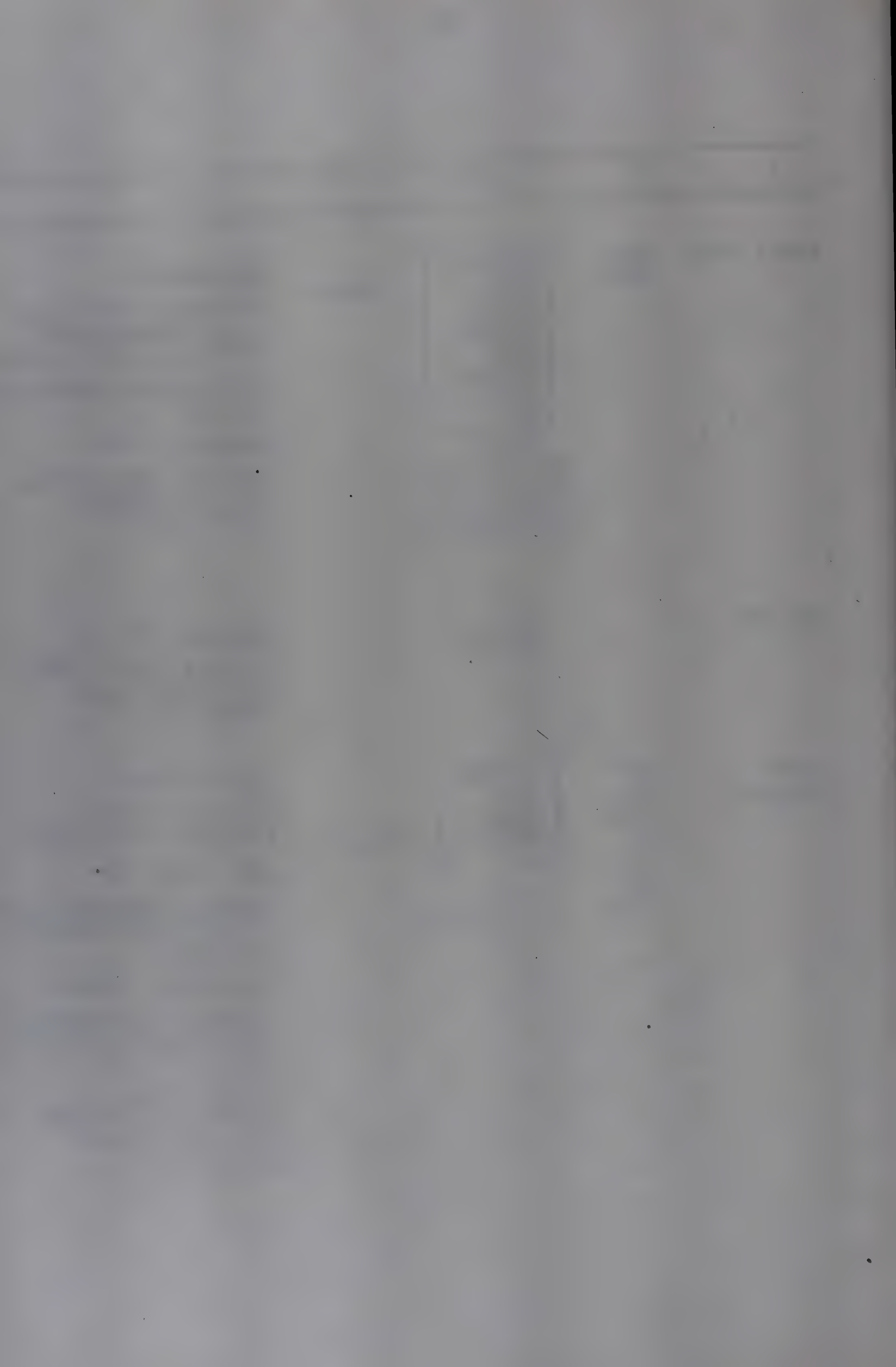
1	2	3	4	5
Assam	RRL(Jt) TES(TRA)	[CIMPO CRRI CFTRI CBRI PC]	Jorhat	
Arunachal Pradesh	-	RRL(Jt) (Branch)		
Bihar	NML CFRI CMRS	[CSIO NGRI CLRI PC] CFRI (at Ranchi)	Patna	<u>NML</u> , Jamshedpur Corrosion testing and servicing; Hydro-cum-electro metallurgical testing; Sponge iron testing.
Karnataka	NAL CFTRI VITM IPIRA	[CIMPO INSDOC CSIO NGRI PC] CFTRI (at Mangalore)	Bangalore	<u>NAL</u> , Bangalore Information Centre for Aeronautics <u>CFTRI</u> , Mysore Food Science and Technology Information Centre
Kerala	-	[CFTRI CSIO CMERI CGCRI PC]	Tri-vandrum	<u>CMERI</u> , Durgapur Design, engineering and consultancy (mechanical).

1	2	3	4	5
Madhya Pradesh	-	CPHERI CFRI NGRI CLRI PC	Bhopal	-
Maharashtra	NCL CPHERI MSTM BTRA SASMIRA IRMRA WRA ARAI	CFTRI CPHERI CLRI IRMRA CECRI CGCRI ITRC CIMPO NIO TICCI PC	Bombay	<u>NCL</u> , Poona Design, engineering and consultancy (chemical industry) <u>MERADO</u> , Poona Design, engineering and consultancy (mechanical)
		MERADO (poona) CFRI (Nagpur)		
Chandigarh	CSIO	Indo-Swiss Training Centre; Training Centre for S&M/Instruments; Training Centre for Precision Instruments Technicians; PC	Chandigarh	<u>CSIO</u> , Chandigarh Design, engineering and consultancy (instruments industry)

1	2	3	4	5
Delhi	NPL CRRI INSDOC PID Museum	[CSIO CPHERI ITRC IIP PC]	Delhi	<u>NPL</u> , Delhi Design, engineering and consultancy (electro- nics and instruments) <u>Information Sciences</u> (See 10)
Goa, Daman and Diu	NIO	-		<u>NIO</u> , Panaji National Oceanographic Data Centre
Gujarat	CSM ATIRA	[CPHERI NML CBRI CGCRI CMERI CLRI * PC]	Ahmeda- bad	-
Himachal Pradesh	-	CIMPO CRR I		
Jammu and Kashmir	RRL (Ju)	[CIMPO CSIO DRL (CIMPO) CFRI PC]	Jammu	-
		Srinagar Branches: RRL (Ju) CIMPO DRL (CIMPO)		

1	2	3	4	5
Manipur	-	RRL(Jt) Branch	-	-
Meghalaya	-	RRL(Jt) Branch	-	-
Orissa	RRL(B)	NML(?) (alternative location for Marine Corro- sion Testing)	-	-
Punjab	-	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> CFTRI MERADO CLRI* NML* PC </div> CLRI sub- centre at Jullunder NML sub- centre at Batala	Ludhiana	<u>MERADC</u> , Ludhiana Design, engineering and consultancy (mechanical)
Rajasthan	CEERI	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> CIPHERI CSIO NGRI CRRI CMERI CLRI PC </div>	Jaipur	<u>CEERI</u> , Pilani Design, engineering and consultancy (electronics) <u>CMERI</u> , Jaipur Design, engineering and consultancy (mechanical)

1	2	3	4	5
Tamil Nadu	CLRI CECRI	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> SER(R)C CSIO CECRI MERADO NML CPHERI ITRC PC NML ? </div> (alternative location for Marine Corro- sion Testing)	Madras	<u>CLRI, Madras</u> Industrial and Tech- nical Information Centre and Data Bank; International Training Centre <u>MERADO, Madras</u> Design, engineering and consultancy (mechanical)
Tripura	=	RRL(Jt) Branch		<u>SER(R)C, Madras</u> Design, engineering and consultancy (structural)
Uttar Pradesh	CDRI ITRC CIMPO NBG IIP CBRI SERC	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> CPHERI CLRI CMERI CFTRI* PC </div> CIMPO at Haldwani	Kanpur	<u>CDRI, Lucknow</u> Regional Centre for testing and analysis; <u>SERC, IIP, Dehra Dun</u> Design, engineering and consultancy (chemical industry) <u>CBRI, SERC, Roorkee</u> Design, engineering and consultancy (buildings and structures) <u>CMERI, Kanpur</u> Design, engineering and consultancy (mechanical).



1

2

3

4

5

West
Bengal

CGCRI
IIEM
BITM
CMERI
IJIRA
IPRA
IRMRA
TRA

CPHERI
CLRI
NML
CSIO
MERADO
ITRC
CECRI
IPIRA
CIMPO
PC

Calcutta

CMERI, Durgapur
MERADO, Calcutta
Design, engineering
and consultancy
(mechanical)

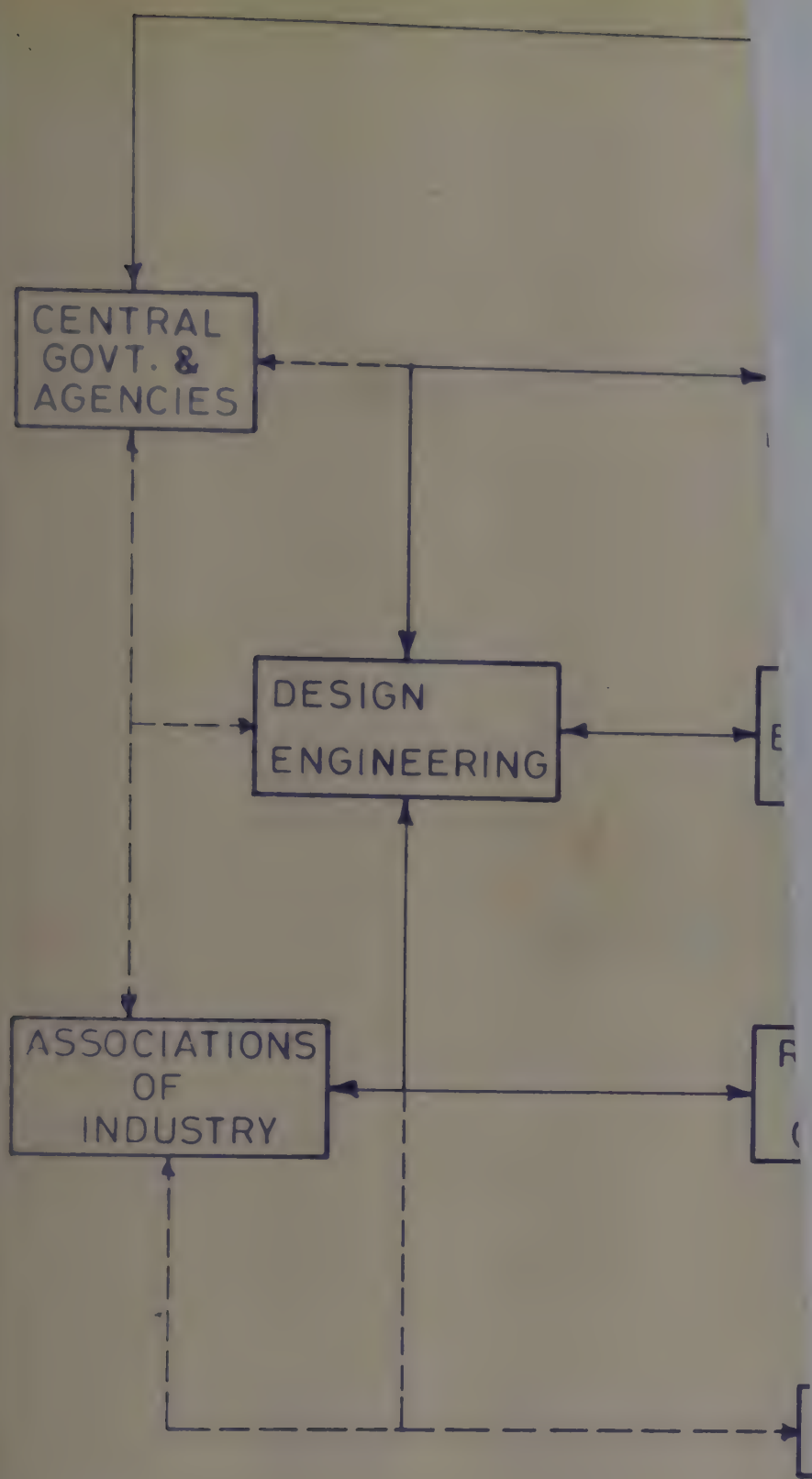


FIG.3. CSIR NETWORK IN REL

APPENDICES



APPENDIX I

ASSIGNMENT



APPENDIX I

Copy of the D.O. letter No. DG/PS/73. 354 dated Feb.23, 1973 from Dr. Y. Nayudamma, Director General and Secretary to the Government of India, CSIR, New Delhi addressed to Dr. G.S.Sidhu, Director, RRLH and copy endorsed to Dr. B.L. Amla, Director, CFTRI, Mysore-2 and Sri.Bharat Bhushan, Deputy Director, RRL, Hyderabad-9.

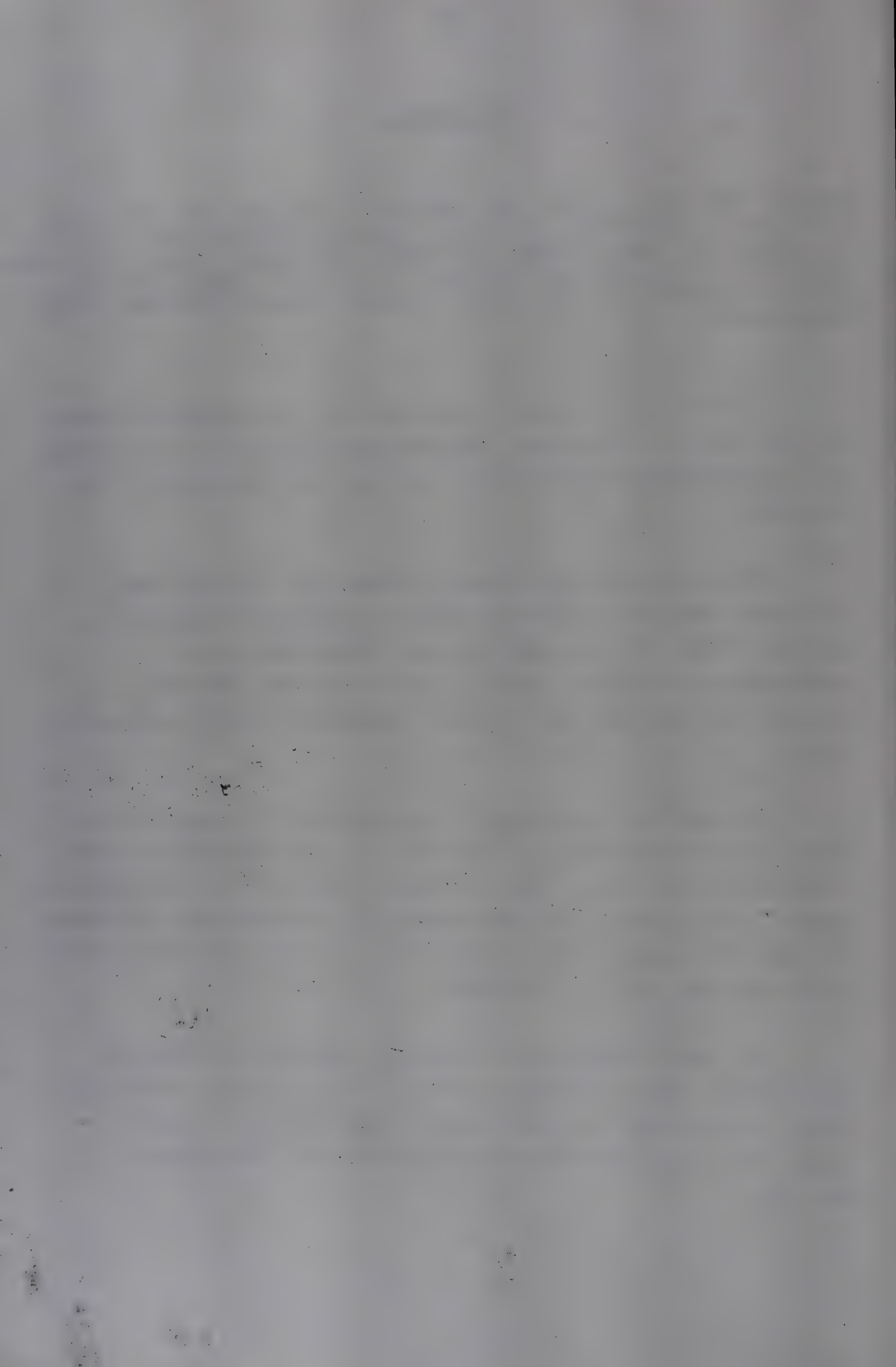
.....

I write this letter to request you, Mr. Bharat Bhushan and Dr. Amla to undertake an assignment for CSIR for setting up of appropriate laboratories in the various States of the country.

CSIR has been receiving a number of requests from different States to set up a Regional Research Laboratory. At the outset let me make it clear that CSIR is not interested in setting up RRLs on the pattern obtained earlier as the RRLs have become virtually national Laboratories.

The present thinking is that we should first ask the State and the industry in the State to identify clearly the Five-year plans, the areas of major thrust, the technological tasks involved and what CSIR should do specifically for them. On the other hand, CSIR on its own, may tell the State as to what CSIR can do for the State.

The second step is to exchange such notes; discuss together by CSIR officials with the officials and industrialists of the State and the industry to arrive at specific areas where there could be interaction for the maximum benefit.



The third step is to ask the appropriate national laboratories to assign two or three experts in the first instance for this job and a nucleus is set up in the State immediately.

The fourth step is to decide as to the organisation and structure of the type of the Unit CSIR propose to put up. It will be a simple technical information centre, extension centre or a multi-laboratory CSIR complex or a design and development centre or a mixture of these. It should be flexible and it should be multi-disciplinary and the important thing of it is that such a structure should meet the needs and demands of the State and would be answerable to the technological tasks agreed upon.

The fifth step is to arrange in the very beginning for the involvement and commitment of the State and the industry to be associated with the CSIR set-up. It would be 50% of the total expenditure and recurring expenditure in States which can afford. It may be much less in other States. There is no fixed pattern for this.

We have requests from seven States at the moment. Someone from CSIR should undertake this responsibility of visiting the States, preparing the reports and arrive at finally an agreed proposal between the State and the CSIR. We wish to do this job within a period of three months. The background papers will be available with Mr. Baldev Singh and Mr. Rahman.

1. The first part of the paper is devoted to a general discussion of the problem of the existence of a solution of the system of equations (1) for arbitrary values of the parameters α and β .

2. The second part of the paper is devoted to a detailed analysis of the case of the existence of a solution of the system of equations (1) for arbitrary values of the parameters α and β .

In view of your experience in extension service and also of running a Regional Laboratory, I thought it best that this responsibility is allotted to you and associating with you Dr. Amla and Mr. Bharat Bhushan. I know this is an additional work for you; but I think it is necessary that a Director of your maturity should undertake this task for CSIR.

I would appreciate that the three of you would agree to this request and undertake this work starting from the month of March 1973. I am sending a copy of this letter to Mr. Bharat Bhushan and Dr. Amla. Between you three, you may share the responsibility but come out with concrete reports for me to go to the Finance and get the approval of the Governing Body, etc. in the month of June 1973.

If you agree, the three of you could meet with Baldev, Rahman and Krishnamurthi at CSIR and arrive at a time-bound plan of action. Any assistance that you may require, the CSIR office will provide.

With kind regards,

Yours sincerely,

Sd/-

(Y. Nayudamma)

APPENDIX II

Guidelines for setting up
Regional Research Laboratories

APPENDIX IICOUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH

GUIDELINES FOR SETTING UP REGIONAL RESEARCH LABORATORIES/REGIONAL AND EXTENSION CENTRES OF SPECIALISED LABORATORIES AS RECOMMENDED BY THE CHAIRMEN OF INTER-LABORATORY CO-ORDINATION COUNCILS AT THEIR MEETING HELD ON 18-3-72 AND APPROVED BY THE VICE-PRESIDENT, C.S. I.R.

....

A Committee under the Chairmanship of Prof.T.R.Seshadri was set up to examine the functioning, their relationship with the specialised laboratories, contributions made and formulate suitable guidelines for the Regional Research Laboratories. The Report of this Committee has already been submitted. Most of the recommendations refer to the specific programmes of the 4 Regional Research Laboratories. Amongst the general recommendations, the Committee has proposed that the Regional Research Laboratories should be multi-purpose in character catering to the problems of relatively broad regions. They have further stated that a Regional Research Laboratory should not be identified with the State of its geographical location and should remain autonomous within the framework of the agreed guidelines for their work.

In the meantime, there have been demands from various States such as U.P., Madhya Pradesh, Rajasthan, Kerala, Gujarat for setting up Regional Research Laboratories in their States. Some States have also asked for setting up Regional Stations of Specialised laboratories. There have also been requests for setting up of information centres

for particular industries on the lines of the Technical Information Centre set up jointly by the Indian Chemical Manufacturers' Association and the CSIR at Bombay for the chemical industry. Some guidelines should be laid down for the setting up of Regional Research Laboratories, Regional Stations/Extension Centres, Information Centres etc. The note discusses some of these guidelines.

Since India is a vast country of long distances separating specialised laboratories from users, there is a good case for extending facilities in diverse forms to assist the industrial and economic development of various parts. This could be done in one or more of the following ways:-

1. Technical Information Centres for Specialised Industries
2. Polytechnological clinics or Information and Liaison Centres
3. Extension Centres of Specialised Laboratories
4. CSIR Complex based on Madras model
5. Regional Research Laboratories
6. Design, Development and Research Centres

Excepting the last, the CSIR has experimented with each of the above forms.

1. Technical Information Centres of Specialised Laboratories:

The Centre at Bombay for the Chemical Industry has functioned successfully and has earned a good name with the chemical industry. 50% of its finances are provided by the

27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

101-102

103-104

105-106

107-108

Indian Chemical Manufacturers' Association, the rest being provided by CSIR. The scientific staff is on the rolls of the CSIR but their salary is included in the 50% share of the CSIR. The Centre has served as a contact point by arranging meetings between the Directors/Scientists and Industrialists, collecting data on imports and exports, identifying projects for small scale industry and publishing a bulletin providing information to the industrial firms on specific projects being worked in the CSIR laboratories. It is located in the premises of ICMA, Bombay.

There have been requests for a similar office in Calcutta by the chemical industry located there. CSIR may agree to such requests for opening of Information Centres for specialised industries provided the representative organizations of these industries bear at least 50% of the cost for the setting up of such a centre. For reasons of security of career the scientific staff may be on the rolls of the CSIR but seconded to the industrial organisation. For the successful functioning the Technical Information Centres should have proper organisational support and transport facilities.

2. Polytechnological Clinics:

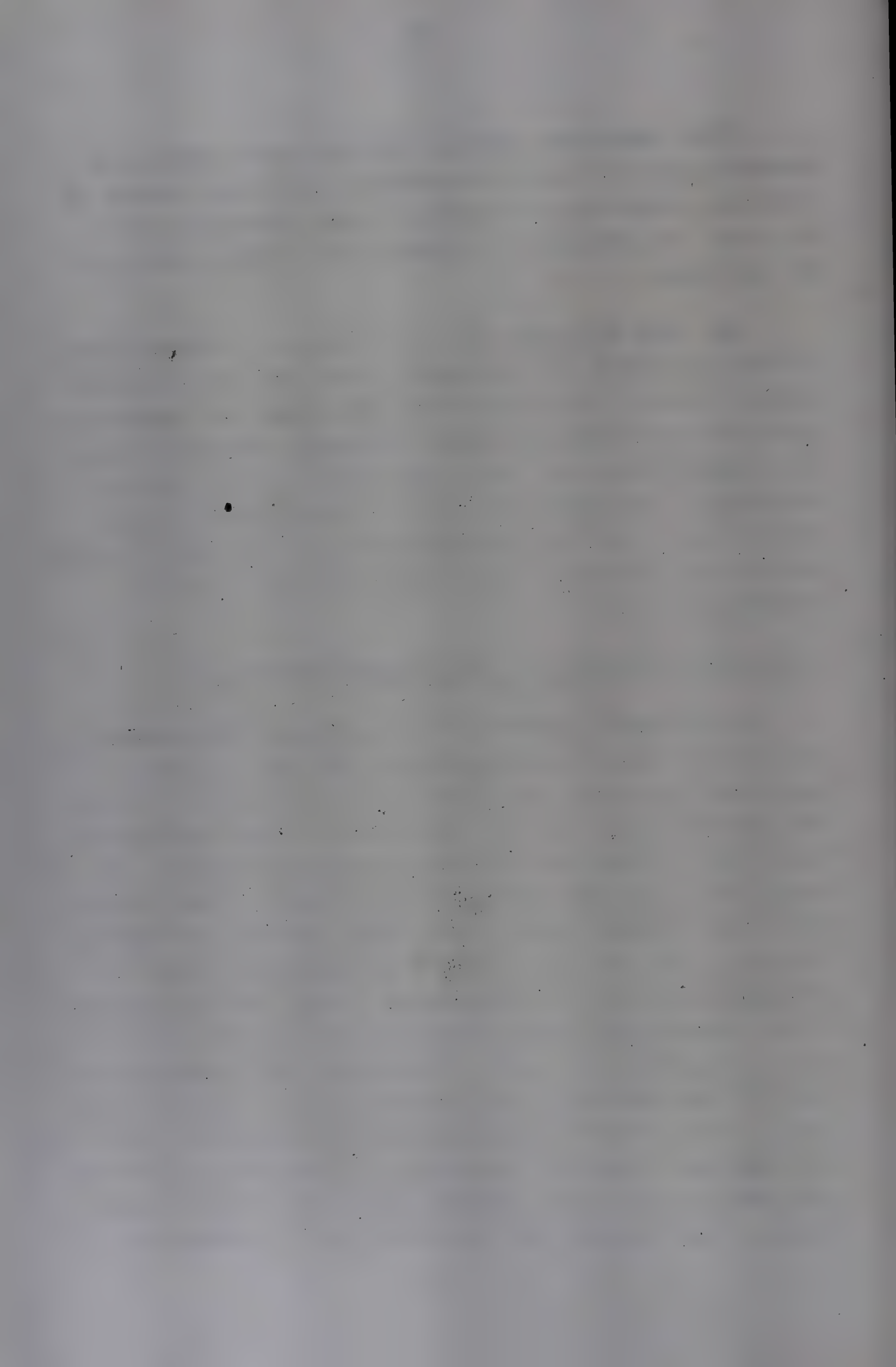
These Centres are in the nature of diagnostic, information and direction Centres for the group of industries in a particular area. Their capability should consist not so much of problem solving but of being able to understand the problem and direct the industrial firm concerned to source where its problem could be tackled within or outside the CSIR. These could be useful links with the Directors of Industries of the States, small and medium scale industries and the Small Industry Service Institutes, IITs and Universities on the one hand and the CSIR Laboratories on the other.

There have been offers from the Mysore Chamber of Commerce and the Mysore Government; the Indian Chamber of Commerce, Calcutta and the West Bengal Government that they will be agreeable to finance such centres up to 50% of the budget.

The CSIR may agree to the setting up of such Centres suitably equipped with technical literature and manned by people having a wide spectrum of knowledge and information experience provided the State Government concerned takes the responsibility of 50% capital and recurring budget financing. The contribution by the Chambers of Commerce should form a part of the contribution of the State Government but the responsibility should be with the State Government.

3. Extension Centres of Specialised Laboratories:

At present, a number of laboratories have Regional Stations or Extension Centres with the specific purpose of rendering technical assistance to the industries in their specialised area. Some of these Centres have experimental facilities to carry out testing, standardisation etc. in respect of local raw materials and products. CFRI, CFTRI, CLRI, CSIO, CIPHERI, CMERI, SERC, CBRI and NML fall in this category. Most of these Centres are manned by CSIR personnel under the administrative control of the Directors of the specialised laboratories and are fully funded by the CSIR. Recently, the Gujarat Government have approached the CSIR for the setting up of a Centre to serve the glass and ceramic industries in the State and have offered to make a contribution of 50% to the running of the Centre. In this contribution the local industry will make half the contribution. The Chairman of Inter-Laboratory Coordination



Councils at their meeting held on 17th and 18th March, 1972, considered whether in future the Extension Centres set up specifically to render technical assistance to a group of industries in a particular area should be set up on the following conditions:

1. That there is active involvement by the industrial firms in the area for the setting up of the Centre as evidenced by their agreeing to contribute a share in the expenditure of the Centre.
2. That the State Government is actively involved and offers cooperation and support for the setting up of the Centre as evidenced by their agreeing to make a financial contribution along with the industry and taking the responsibility for the latter's contribution. The total contribution of the State Government and the industry should not be less than 50% of the cost of running the Centre.

The Group recommended that in the case of Extension Centres of Specialised Laboratories, the CSIR may not insist upon 50% contribution being made by the State Government and/or the Industry. There should, however, be commitment from the State Government and Industry as evidenced by demand made by them accompanied by at least a token commitment.

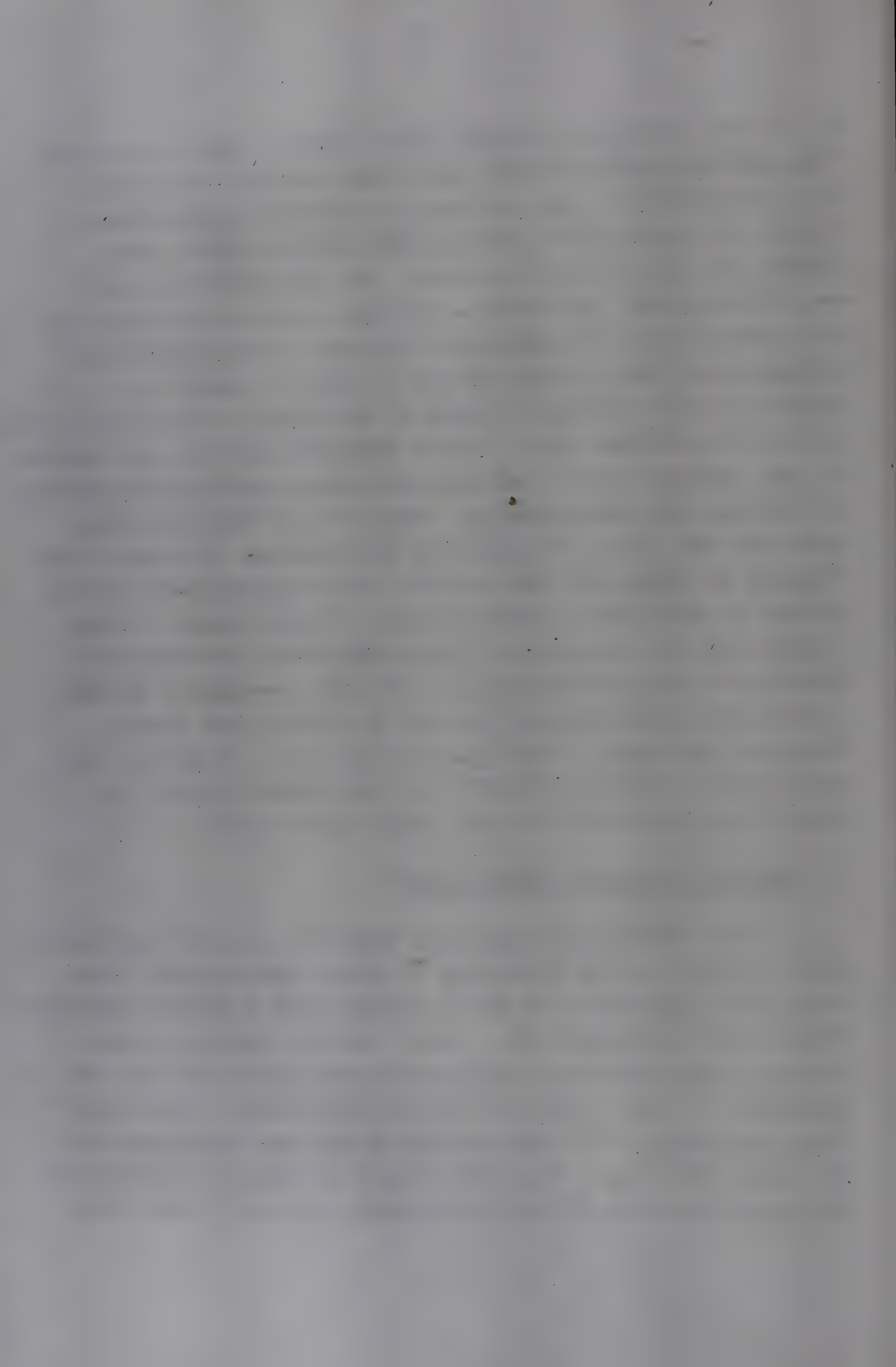
4. CSIR Complex based on Madras model:

CSIR complex idea arose out of the recommendations of the Third Reviewing Committee that if Extension Centres of more than one laboratory are located in the same town then

it will be desirable to house them together and provide them with unified administrative and other service facilities. This culminated in the setting up of Madras Campus where a number of laboratories such as SERC, CECRI, CMERI, CSIO, CIPHERI etc. have set up Centres. The administrative and accounting staff, and service facility such as transport etc. are common to all the Extension Centres. This complex is already more than a year old and it will be useful to evaluate as to whether it leads to sufficient multi-disciplinary interaction between the various Extension Centres and whether it can lead to common task projects; what are the difficulties in running its administration common to all these centres; what are the lines of control of the Director Incharge of the Complex as related to the control of the specialised laboratories to whom these centres belong. On the basis of this evaluation, the Chairmen of Inter-Laboratory Coordination Councils at the meeting held on 18.3.72, considered whether a similar pattern may be followed in cities like Bombay, Calcutta and Delhi. The Group decided that the person who heads such a Complex should be an independent person and should not be attached to any single Laboratory.

5. Regional Research Laboratories:

The nomenclature Regional Research Laboratories has not been favoured by the Directors of these Laboratories. The Directors' Conference at Poona desired that a better nomenclature should be thought of. These laboratories are in the nature of multipurpose, multidisciplinary units and have the advantage of servicing a variety of industries. Because of close availability of specialists in various disciplines in the same laboratory, they have a good prospect of organising projects requiring inter-disciplinary approach. The other



aspect is, that the State Governments feel that since they are State based, they are concerned primarily with their problems. Whereas facilities by way of availability of land etc. are given but the financing is almost entirely by the CSIR. Since the broad areas/disciplines of work of the RRLs also obtain in the specialised laboratories, there is need for closer coordination of their programme and a better system of interflow and communication.

In their structural pattern viz. resource relationship between laboratory research, pilot plants, design and development, basic or fundamental research, the RRLs present almost the same picture as the specialised laboratories. The following guidelines were considered by the Chairmen of Inter-Laboratory Coordination Councils at the meeting held on 18th March, 1972 in regard to the Regional Research Laboratories:

1. The RRLs must be set up as a major multidisciplinary and interdisciplinary effort and their programmes could preferentially be oriented to well-identified research projects where multidisciplinary approach is most fruitful. In the structuring of the multidisciplinary laboratory, there should be a gradual shift from 'R' towards 'D'. The design and development component of the structural pattern should be expanded and strengthened so that in due course they develop the competence and capability for concentrating on the resource intensive parts of the innovation chain. The research and investigation part should also relate to the needs of design and development of industry of the region and characteristics of their natural raw materials and resources.

2. The State Governments should be actively involved and should agree to contribute 50% of the expenditure on the running of the Laboratory. The Group considered the question of renaming the Regional Research Laboratories and agreed that suggestions may be invited from the staff of these Laboratories with a proviso that the most appropriate name accepted would earn an award.

6. Design Development and Research Centres:

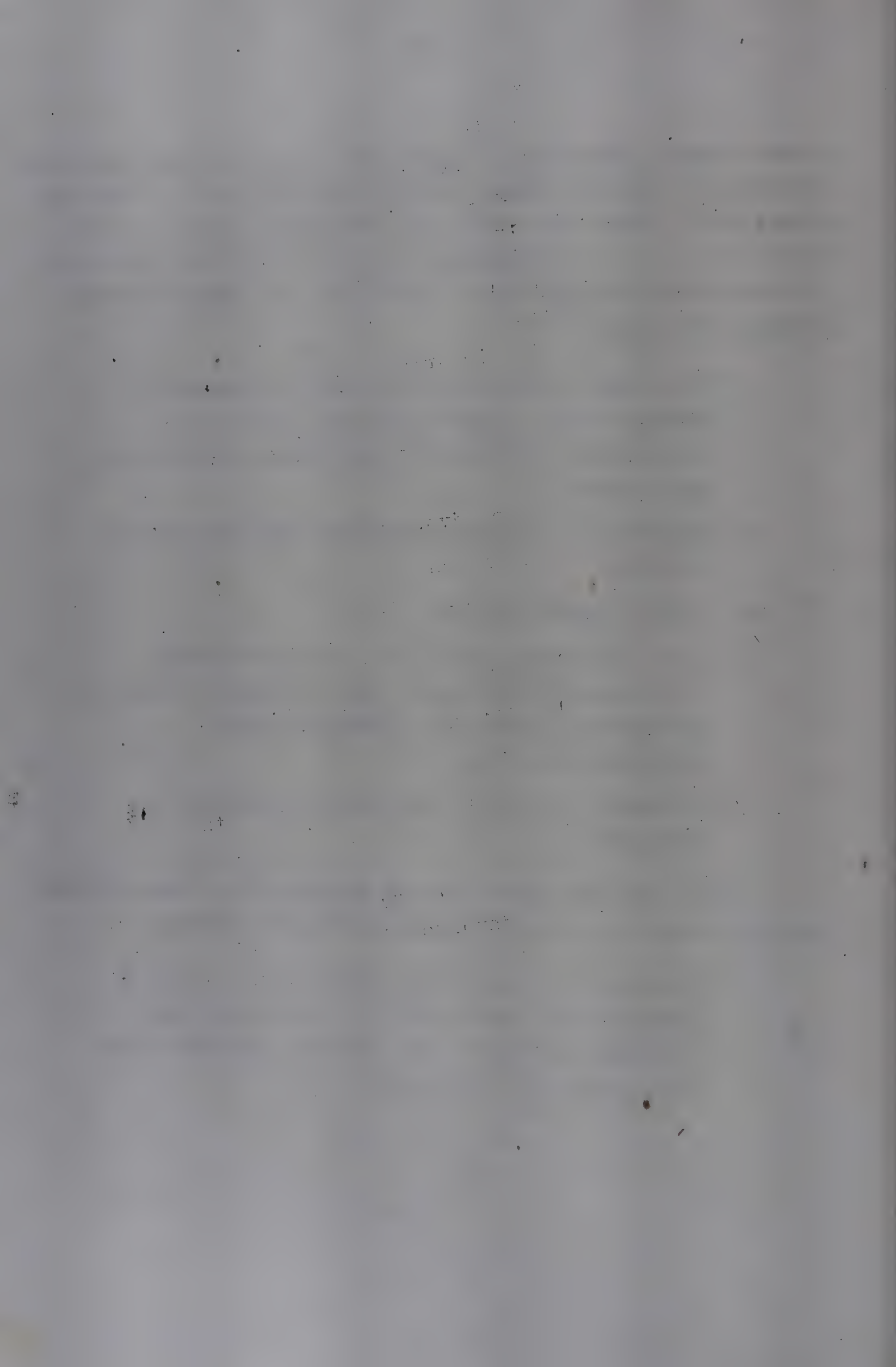
These Centres should be set up to have a direct relevance and provide scientific and technical potential for the planned industrial and economic development of the State of their location. They should essentially be development advisors and engineering consultants with an inbuilt component and infrastructure for research and investigation facilities to meet their captive needs and such Centres have been set up with the help of Batelle Memorial Institute in Beirut (Lebanon) and South Korea and have proved of considerable help and have become a major factor in successful technology transfer. The specialisation and facilities in the Centre should correspond to the raw materials, agricultural, mineral resources and industrial plans in which these Centres will be directly involved. The primary aim of the Centres is development and promotional helping the State Governments to expeditiously evaluate resources, acquire or develop the technology and provide the technological and engineering component for setting up industrial projects. They should also be capable of advising on quality control, analytical and testing facilities, technical advice and facilities to local industrial firms. These Centres would thus have

a much higher component of engineers, technologists, planners (economists, statisticians, survey experts) than of research scientists. Where the States are too small, such a Centre could service 2 or 3 neighbouring States by mutual agreement on research programmes etc. They will have the following primary divisions:-

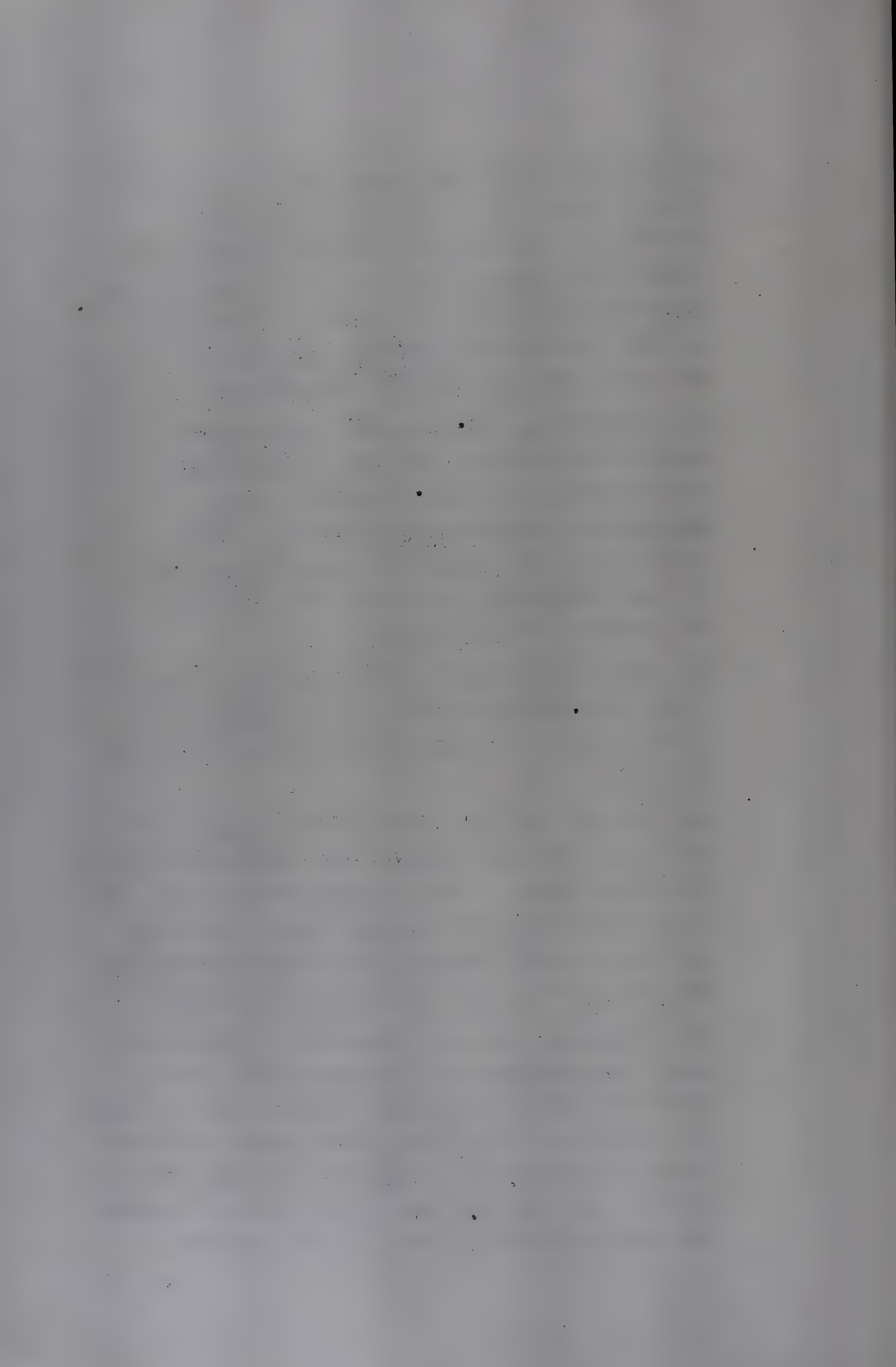
- i) Division of planning and survey of mineral, agricultural, forest and other resources, industrial information, statistical information and liaison
- ii) Division of industrial design and engineering projects
- iii) Pilot plants division
- iv) R & D Division related to the specialised resources of the region such as paper, ceramics, chemicals, drugs and pharmaceuticals, metallurgical etc.
- v) Division on quality control, testing and analysis

These Centres may be set up provided the State Government/Governments concerned agree to the following:-

1. The State Government(s) must assure a direct interest and involvement by making at least a 33% contribution to the capital and recurring expenditure of the Centre



2. The Design Development and Research Centre should have a direct access to and be an ex-officio consultant to the Department of Industries, Agriculture, Forestry and Planning. The Director/Scientists should be involved in all industrial/technical planning of projects handled by these departments
3. The industrial firms in the State/Region should be associate members of the Centre and contribute a regular amount to the capital and recurring expenditure. This could be on the basis of a compulsory levy by the Industries Department of the State in relation to production
4. The State Government and associate members would have representation on the Advisory Council of the Design Development and Research Centre.
5. The overall control of the Centre would rest with the CSIR who would be the management agency for the Centre. This is essential to give it a National character as also ensure mobility and interchange between the staff of the Centre and the national and regional laboratories.
6. The Programme Advisory Committee of the Centre should be composed of representatives of the State Government associate members and the CSIR. The Executive Committee of the Centre would be on the same pattern as all the National Laboratories, viz. the Director would be the Chairman and would consist of some project leaders



7. The financial share of the State Government(s) and levy from industries would be contributed to the CSIR by the State Government(s)

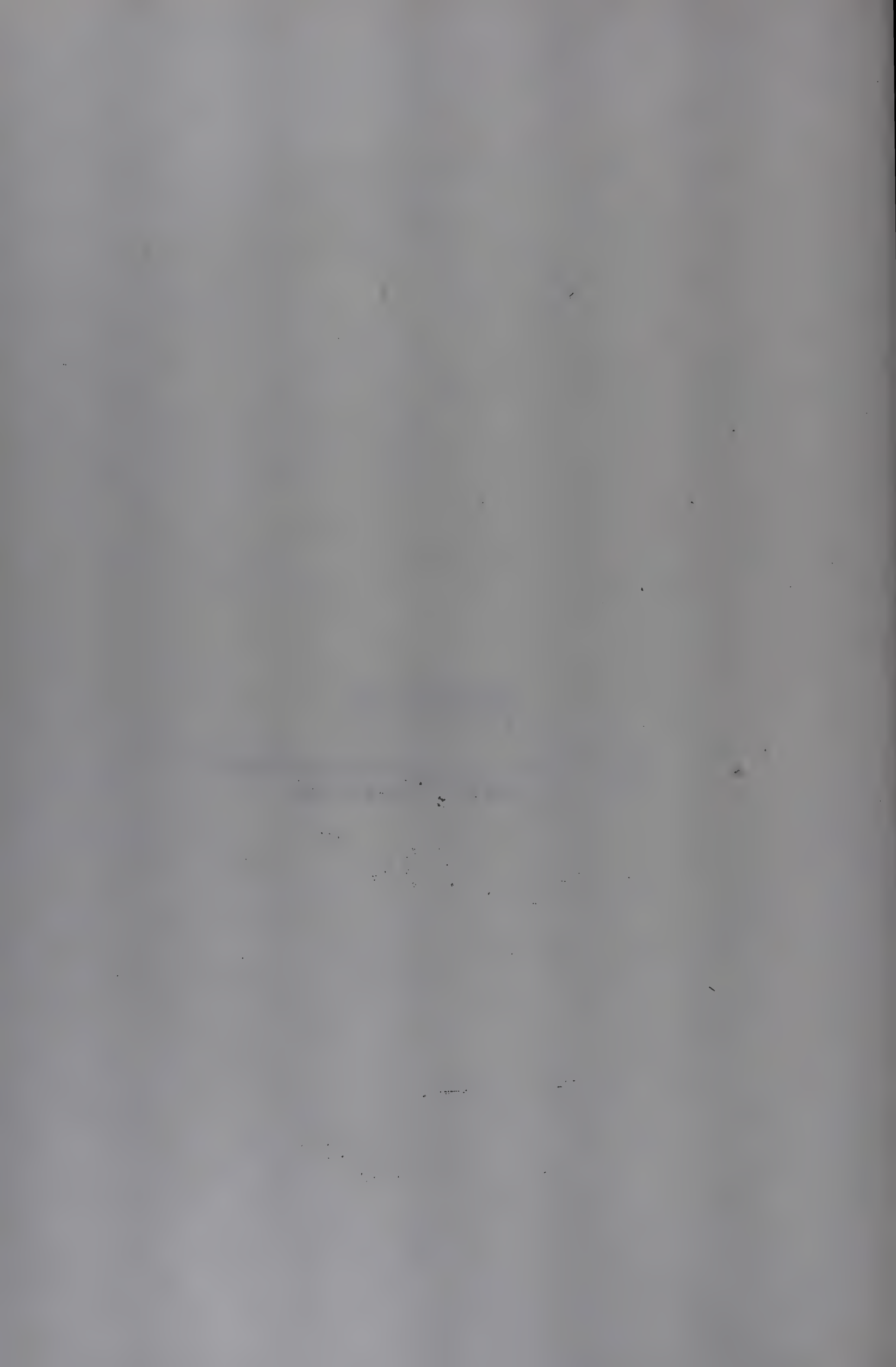
7. Chemical and Mechanical Engineering Consultancy Services:

These services should be set up to:

- (a) advise the CSIR and NRDC on techno-economic feasibility of the processes investigated in the laboratories in respect of adequacy of the data etc.;
- (b) undertake investigation, preparation of techno-economic feasibility reports against payment, if necessary;
- (c) identifying/locating capabilities in the field of chemical and mechanical engineering in the CSIR laboratories and advise in regard to their strengthening/augmenting of the resources and building up of these capabilities;
- (d) advising the CSIR/NRDC on selection of consultancy firms; and
- (e) undertaking industrial design on some of the processes/products as may be directed from time to time.

APPENDIX III

Analytical and Testing Facilities
available in Rajasthan



MATERIAL TESTING LABORATORY

1. Tensile test on one metal rod upto 70 tonnes

a)	Specimen ready to size	Each	30.00
b)	Specimen to be prepared in College	"	32.50
c)	Extensometer to be used	"(Extra)	7.50
d)	Tension test on welded bars or wire ropes	"	35.00
e)	Tension test on wires	"	20.00

2. Compression Test

a)	<u>On metal upto 100 tons</u>		
i)	Specimen ready to size	"	20.00
ii)	Specimen to be prepared	"	25.00
b)	On Timber along and across the grains	"	25.00

3. Bending Test

a)	On girders, beams etc. upto 70 tons load and 1 m. span	"	30.00
b)	On Timber specimen of 45 cm x 3 x 3 cm or 60 cm x 4 x 4 cm size for modulus of Rupture of Modulus of Elasticity	"	25.00

4. Impact Test (Izod or Charty method)

a)	On metals, specimen ready to size	"	10.00
b)	On metals, specimen to be prepared	"	15.00
c)	On wires	"	10.00

5.	Hardness Tests (Brinell, Rockwell or types (Four impressions)	Each	20.00
6.	<u>Shear Tests</u>		
	a) On metal capacity upto 70 tonnes	"	25.00
	b) On Timber along grains	"	30.00
7.	Indentation test (Kanka and Brinell) on timber	"	15.00
8.	Test on laminated or coiled springs		20.00
9.	Cold bond test (as per sample supplied)		5.00
10.	Fatigue Test (Rotary plane bending)	Each set of two specimen	150.00

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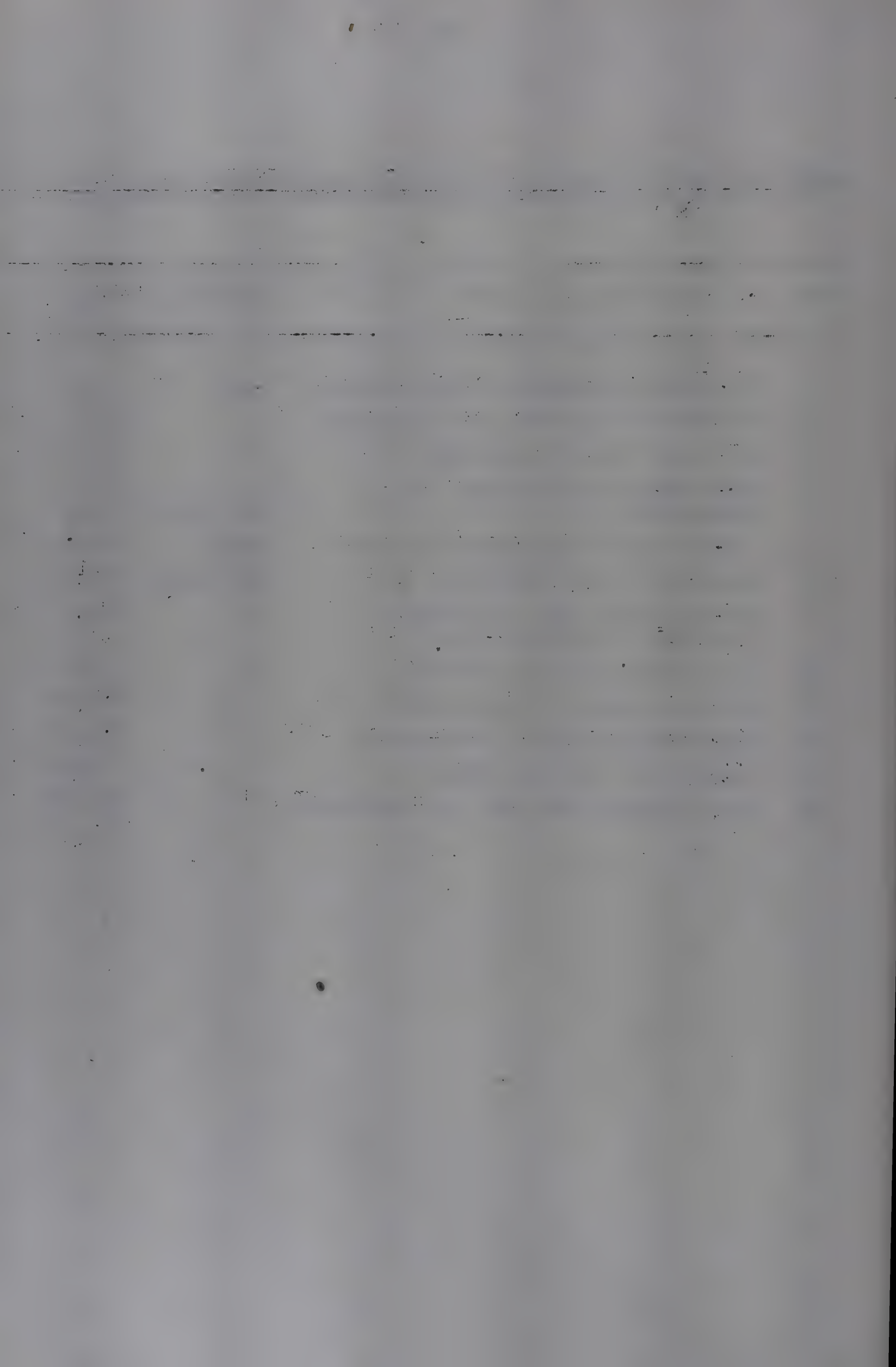
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RATES OF TESTING CHARGES IN CONCRETE ENGINEERING LABORATORY

S.No.	Description of test	Quantity	Rate in Rs.
1.	6" cubes of concrete for crushing	Each	6.00
2.	4" cubes of concrete for crushing	"	6.00
3.	Briquette test in tension	"	5.00
4.	Bulk density and sp.gr. of aggregates	One sample	7.00
5.	Compression test on mortar cubes	Each	3.00
6.	Soundness test on cement	One sample	12.00
7.	Setting time test on cement (initial as well as final)	"	10.00
8.	Consistency test on cement	"	7.50
9.	Sieve analysis of aggregates		60.00
10.	Percentage voids in aggregates		75.00
11.	Density of sand or cement		5.00
12.	Water absorption test on aggregates	"	35.00



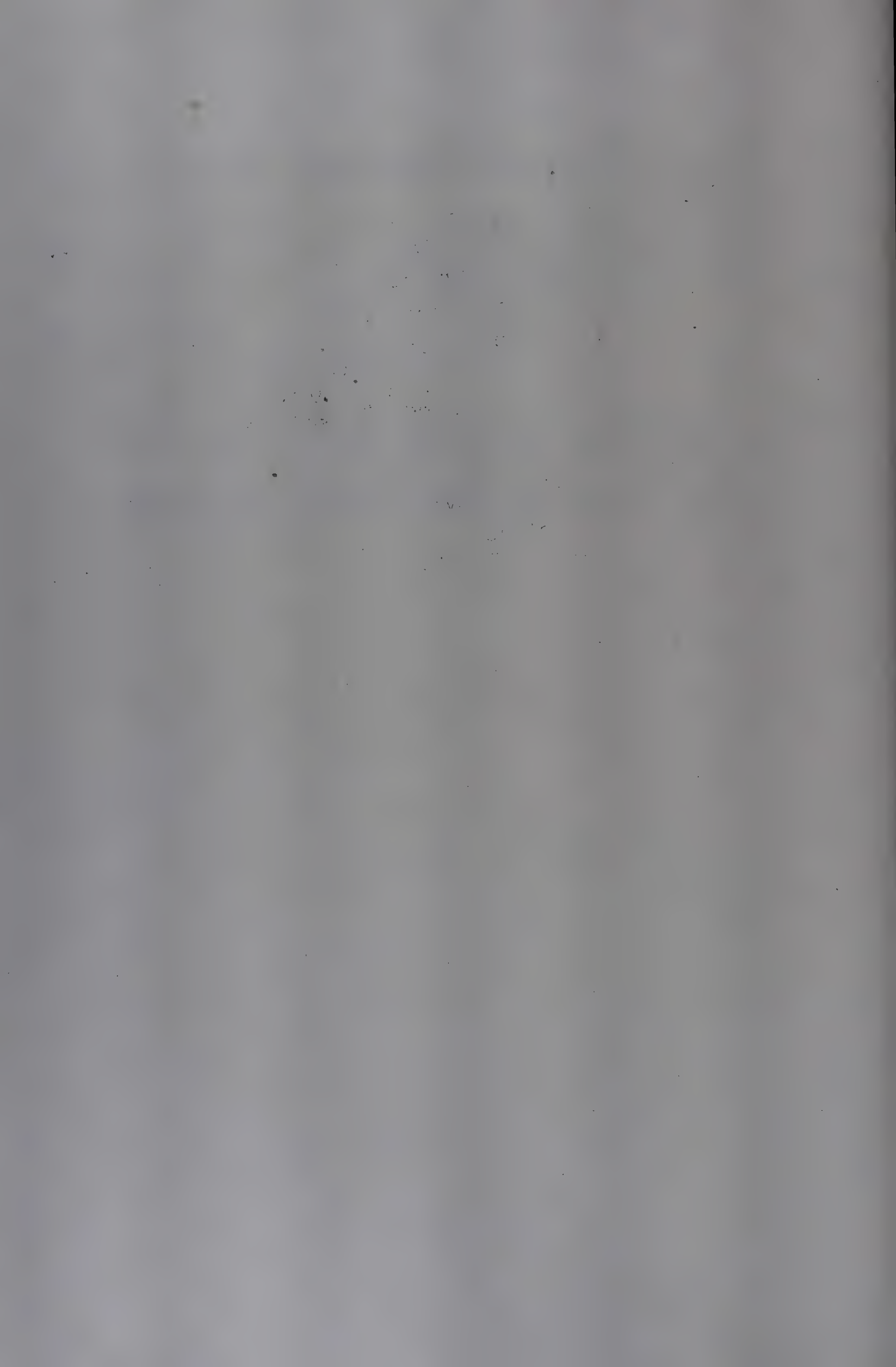
RATES FOR CONDUCTING TEST ON SOILS

1.	Atterburg's Limits (Liquid limit and plastic limit with flow curve)	Per sample	50.00
2.	Sieve Analysis (dry test)	"	30.00
3.	Sieve Analysis (wet test)	"	40.00
4.	Hydrometer Analysis	"	50.00
5.	Pipette Analysis	"	60.00
6.	Shrinkage limit	"	30.00
7.	Unorained shear box test	"	70.00
8.	Drained shear box test	"	80.00
9.	Standard Proctor's test	"	50.00
10.	Modified Proctor's test	"	60.00
11.	Jodhpur Mini-Computer Test	"	35.00
12.	California Bearing Ratio (with sample preparation)	"	60.00
13.	California Bearing Ratio (prepared specimen to be brought by the party)	"	15.00
14.	Consolidation test	"	100.00
15.	Permeability of undisturbed samples	"	30.00
16.	Permeability of remoulded samples	"	30.00
17.	North Dakota Cone Test <u>in situ</u>	"	40.00
18.	Testing Stabilished Specimen under compression	"	6.00
19.	Maximum-Minimum density of sand	"	20.00
20.	Specific Gravity of Soil	"	30.00
21.	Unconfined compression test (with sample preparation)	"	20.00
22.	Unconfined compression test (Specimen to be supplied by the party)	"	6.00

23.	Field density by water displacement (laboratory test)	Per sample	20.00
24.	Natural moisture content	"	10.00
25.	Plate loading test in Jaipur	"	200.00
26.	Plate loading test outside Jaipur		
	For first test		500.00
	For subsequent test		300.00

N.B:- Conveyance for conducting tests outside Jaipur shall be provided by the party

If test is performed outside Jaipur, T.A. and D.A. of the staff members will be borne by the party



STRUCTURAL ENGINEERING DEPARTMENTLIST OF TEST EQUIPMENTA. Material Testing Laboratory

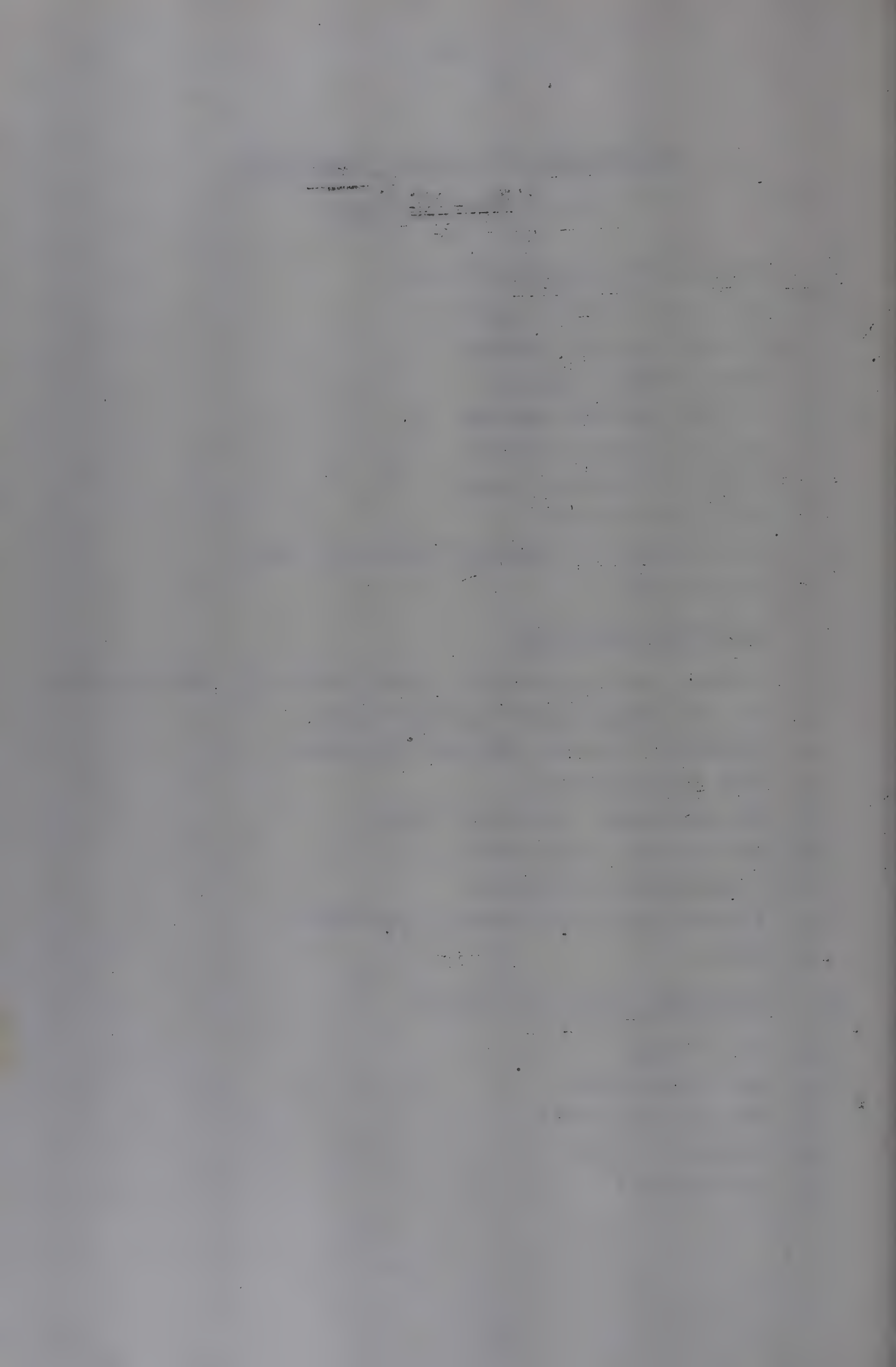
1. Universal testing machine
2. Torsion testing machine
3. Charpy Impact machine
4. Fatigue testing machine
5. Brinell Hardness Tester
6. Rockwell Hardness Tester
7. Begg's Deformeter
8. Extensometer of various types and ranges
9. Polariscopes

B. Concrete Laboratory

1. Mixer: needle vibrator, table vibrator, cube vibrator
2. 100 Ton compression testing machine
3. Briquette testing machine and moulds
4. Oven and balances
5. Shieve-shaker with I.S. Sieves
6. Le-Chatelier apparatus
7. Vicat-needle apparatus
8. Gifford Udall prestressing equipment
9. Mixer

C. Structural Test Laboratory

1. Load cells
2. Load indicators
3. Strain indicators
4. Hydraulic jacks
5. Deformeters



D. Soil Laboratory

1. Electric Oven
2. Rapid Moisture meter
3. Pycnometer
4. Sand replacement method
5. Core cutter apparatus
6. Sieve shaker
7. Sedimentation analysis apparatus
8. Hydrometers
9. Liquid limit apparatus
10. Jodhpur permeater
11. Consolidometer (Belgium)
12. Consolidometer (Jodhpur autolevel)
13. Proctors' test apparatus
14. Proctor's needle
15. Shear box apparatus
16. Triaxial cell for shear test
17. Vane shear apparatus
18. Unconfined compression
19. Split spoon sampler
20. Dame's and Moore Sampler
21. Sample extractor
22. Extractor Frame Universal
23. Portable Field Laboratory
24. Portable Field Laboratory (Shear Testing)
25. North Dakota Cone test
26. Load Frame hand operated
27. Strain gage
28. Pressure cell
29. Vacuum Pump
30. Hydraulic Jack-30 tonnes
31. Needle Vibrator

CIVIL ENGINEERING DEPARTMENT

Rate list for various tests in Hydraulics Laboratory

1. A. C. rain water / Soil pipes
 - (a) Straightness test Rs. 10/-
 - (b) Water tightness test Rs. 25/-
 - (c) Bursting strength test Rs. 50/-
 - (d) Water absorption test Rs. 25/-
2. Calibration of water meters Rs. 50/-
3. Scale models of flow over weirs No fixed rate

Rate list for various tests in Public Health Engineering Laboratory

ANALYSIS OF WATER

1. Determination of chlorides Rs. 25/-
2. Determination of Hardness Rs. 25/-
3. Determination of pH Rs. 10/-
4. Determination of dissolved oxygen Rs. 25/-
5. Determination of fluorides Rs. 50/-
6. Determination of alkalinity Rs. 25/-
7. Determination of iron Rs. 40/-
8. Determination of sulfates Rs. 25/-
9. Coliform test Rs. 50/-
10. Analysis of water to find its suitability for drinking purposes Rs. 250/-

ANALYSIS OF WASTE WATER

1. Chemical oxygen demand Rs. 50/-
2. Biochemical oxygen demand Rs. 100/-
3. Determination of ammonia and organic nitrogen Rs. 100/-
4. MPN Rs. 50/-

Rate list for various tests in Roads Laboratory

(A) Test of Bitumen and Asphalt

1. Penetration test (three readings)	Rs. 60/-
2. Softening point test (four readings)	Rs. 75/-
3. Ductility test (four readings)	Rs. 80/-
4. Viscosity test for tar, mobile oil etc. (seven readings)	Rs. 75/-
5. Solubility test	Rs. 100/-
6. Specific gravity test	Rs. 50/-
7. Loss on heating	Rs. 100/-
8. Flash Point	Rs. 60/-

(B) Aggregate and soil

1. Sieves analysis	Rs. 75/-
2. Particles shape (elongation and flakiness)	Rs. 60/-
3. Resistance to abrasion (a) Los Angeles (b) Dorry's Abrasion	Rs. 100/- each
4. Deval attrition	Rs. 150/-
5. Resistance to crushing (three readings)	Rs. 90/-
6. Resistance to impact (three readings)	Rs. 60/-
7. Sp. Gravity	Rs. 50/-
8. California Bearing Ratio test	Rs. 250/-
9. Proctor compaction test	Rs. 100/-

(C) Test of Bitumen Mixture

1. Marshall stability test	Rs. 280/-
2. Hubbard field test	Rs. 250/-

Schedule of Rates for repairs of Survey instruments

S.No.	Description of defects	Rate in Rupees per instrument		
		Minor defect	Medium defect	Major defect
1	2	3	4	5
1.	Overhauling and adjustment of level	-	40.00	-
2.	Overhauling and permanent adjustment of theodolite	-	80.00	-
3.	Setting of vertical axis	10.00 (Brass)	15.00 (Brass)	30 (Brass)
		15.00 (G.Metal)	20.00 (G.Metal)	35 (G.Metal)
		20.00 (Cobalt steel)	25.00 (C.Steel)	45 (C.Steel)
4.	Setting of foot screws	10.00	15.00	20.00
5.	Providing and fixing diaphragm	15.00	20.00	25.00
6.	Providing and fixing bubble tube	20.00	25.00	30.00
7.	Making focussing management perfect	10.00	15.00	20.00
8.	Setting of horizontal axis in theodolite	20.00 (G.M)	25.00 (G.M)	40.00 (G.M)
		15.00 (Brass)	20.00 (Brass)	35.00 (Brass)
		25.00 (C.S)	30.00 (C.S)	50.00 (C.S)
9.	Repairing of clampint arrangement	2.00	5.00	8.00
10.	Repairing of slow motion arrangement	2.00	6.00	10.00
11.	Filling of graphite in diaphragm	1.00	1.50	3.30
12.	Providing and fixing clamp or slow motion screw	15.00	20.00	25.00
13.	Removing eccentricity of verniers in horizontal/vertical scales of theodolite	20.00	25.00	30.00

1	2	3	4	5
14.	Repairs of sliding device of diaphragm	5.00	7.00	10.00
15.	Providing and fixing sliding device of diaphragm	35.00	40.00	45.00
16.	Providing and fixing eye piece	30.00	35.00	42.00
17.	Providing and fixing foot screw	25.00	33.00	42.00
18.	" " rack	8.00	10.00	12.00
19.	" " pinion	3.50	4.50	6.00
20.	Providing and fixing window glass to horizontal/vertical plate of theodolite	2.50	3.50	4.50
21.	Providing and fixing leather belt to stand	-	5.00	-
22.	Providing and fixing leather belt to box	5.00	6.00	8.00
23.	Repair of tilting screw	2.00	5.00	10.00
24.	Repair of eye pick	3.50	7.50	15.00
25.	Providing and fixing brass case for longitudinal bubble tube	10.00	15.00	25.00
26.	Setting of optical sighting path in theodolite	50.00	100.00	150.00
27.	Providing and fixing capstain headed nuts	1.50	2.50	3.50
28.	Providing and fixing diaphragm screw	1.25	1.75	2.00
29.	Adjustment of compass fitted with theodolite	-	5.00	-
30.	Adjustment of compass fitted with level	-	10.00	-
31.	Sharpening of compass pivot	0.50	1.00	1.50
32.	Providing and fixing lifting lever	7.00	8.00	10.00
33.	Adjustment of prismatic compass	-	10.00	-
34.	Providing and fixing graduated circle in prismatic compass	8.00	10.00	12.50

1	2	3	4	5
35. Magnetising the needle of compass		1.00	1.50	2.00
36. Repair of object vane in prismatic compass		2.00	4.50	7.00
37. Repair of sighting vane in P. compass		2.00	5.50	8.00
38. Providing and fixing ball and socket arrangement for P. compass		30.00	35.00	38.00
39. Repair of ball and socket arrangement		4.50	8.50	15.00
40. Providing and fixing pill bubble		5.00	6.00	7.00

LIST OF METALLURGICAL TESTING FACILITIES
AND SCHEDULE OF CHARGES

	in Rs.
<u>NONFERROUS METALS</u>	
1. Complete analysis	135.00
2. Brass and bronzes, gun metal, cupro-manganese, silicon bronze, aluminium bronze, monel-metal, bell metal etc.	
a) Per set of 7 elements or more	135.00
b) Per set of 6 elements	112.50
c) Per set of 3 to 5 elements	90.00
d) Individual element	34.00
3. Type-metal, solder, white-metal, babitt model etc.	
a) Per set of 7 elements or more	135.00
b) Per set of 6 elements	112.50
c) Per set of 3 to 5 elements	90.00
d) Individual element	34.00
e) Tin and lead	68.00
4. German-silver	
a) Complete analysis	135.00
b) Copper-tin-nickel	90.00
5. Aluminium metal and alloys	
a) Complete analysis	135.00
b) Individual element (except aluminium)	34.00

	in Rs.
6. Phosphor copper, copper cadmium alloys	
a) Complete analysis (excepting silver)	135.00
b) Complete analysis with silver	180.00
c) Copper	45.00
d) Silver	45.00
e) Cadmium	34.00
f) Copper, arsenic, lead and bismuth	90.00
g) Copper, phosphorous, iron	90.00
h) Individual element (excepting Cu & Ag)	34.00
7. Lead and lead alloys-antimonial lead etc.	
a) Complete analysis	135.00
b) Individual element (excepting lead)	34.00
8. Tin metal	
a) Complete analysis	135.00
b) Individual element (excepting tin)	34.00
9. Antimony metal	
a) Complete analysis	135.00
b) Individual element (excepting antimony)	34.00
10. Zinc metal, zinc alloys, die casting alloys etc.	
a) Complete analysis	135.00
b) Individual element (excepting zinc)	34.00
11. Magnesium metal	
a) Complete analysis	135.00
b) Individual element (excepting Mg.)	34.00
12. Nickel-metal	
a) Complete analysis	135.00
b) Individual element (excepting Ni & carbon)	34.00
c) Nickel	45.00
d) Carbon	22.50

	in Rs.
13. Manganese metal	
a) Complete analysis	135.00
b) Individual element (excepting manganese)	34.00
14. Mercury metal	
a) Vanadium in mercury	45.00
b) Mercury content	45.00
15. Silver solders	
a) Complete analysis	180.00
b) Silver	45.00
c) Individual element (excepting Ag.)	34.00
16. Gold laces	
a) Gold and silver	90.00
b) Gold	45.00
c) Silver	45.00
d) Complete analysis	225.00
17. Gold	
a) Gold	45.00
b) Silver	45.00
c) Complete analysis	225.00
18. Silver	
a) Silver	45.00
b) Complete analysis	180.00

FERROUS METALS & ALLOYS

1. Plain carbon steel	
a) Carbon, sulphur, phosphorous, silicon manganese (each) per element.	22.50
b) 5 elements together	90.00

in Rs.

2. Alloy steel

- a) Carbon, sulphur, phosphorous, silicon, manganese, nickel and chromium 135.00
- b) Nickel 34.00
- c) Chromium 34.00
- d) Other alloying elements like tungsten, vanadium, molybdenum, cobalt, copper, aluminium etc. (per element). 34.00

3. Cast iron, pig iron

- a) Total carbon, graphitic carbon, silicon, manganese, sulphur, phosphorous 112.50
- b) Total carbon, silicon, manganese, sulphur, phosphorous 90.00
- c) Other alloying elements like nickel, chromium, molybdenum etc. (per element) 34.00

4. Ferro-silicon

- a) Complete analysis 135.00
- b) Silicon 45.00

5. Ferro-molybdenum

- a) Complete analysis 135.00
- b) Molybdenum 45.00
- c) Carbon, silicon, manganese & molybdenum 112.50

6. Ferro-tungsten

- a) Complete analysis 135.00
- b) Tungsten 45.00

7. Ferro-vanadium

- a) Complete analysis 135.00
- b) Vanadium 45.00

8. Ferro-chrome

- a) Complete analysis 135.00
- b) Chromium 45.00

	in Rs.
9. Ferro-manganese, speigel iron	
a) Complete analysis	135.00
b) Manganese	45.00
10. Ferro-phosphorous	
a) Complete analysis	135.00
b) Phosphorous	45.00
11. Galvanisation Test	
a) Efficiency of galvanisation Cu SO dip test	14.50
b) Thickness of galvanisation or weight of spelter coat/area	22.50
12. Thickness of silver plating	45.00
13. Salt spray test for corrosion (for maximum of 96 hours)	45.00

MINERALS ORES

1. Iron ore, manganese ore, copper ore, chrome ore, galena, bauxite etc.	
a) Complete analysis	135.00
b) Major element	45.00
c) Chrome ore (total iron content)	45.00
d) Manganese ore (Manganese, silica, ferric oxide, alumina)	112.50
e) Iron ore (silica, total iron, alumina)	90.00
f) Individual other element	34.00
2. Limestone, dolomite, gypsum, selenite etc.	
a) General analysis	90.00
b) Insoluble residue, lime, magnesia	67.50

in Rs.

3. Other minerals like talc, corundum, fluorspar, rutile etc.	
a) Complete analysis	135.00
b) Alumina	67.50
c) Alkalies (Na_2O & K_2O)	68.00
d) Other major elements like	(each) 45.00
4. Sulphides	
a) Arsenic, antimony, sulphur, iron	112.50
b) Iron, chromium and titanium	90.00
c) Sulphur, arsenic, antimony, nickel	112.50
d) Sulphur	34.00
e) Arsenic	34.00

COAL, COKE, GRAPHITE & BITUMINOUS MATERIALS

1. Coal or Coke	
a) Ultimate and proximate analysis and calorific value	146.50
b) Ultimate analysis and calorific value	112.50
c) Ultimate analysis	90.00
d) Proximate analysis and calorific value	56.50
e) Proximate analysis only	36.00
f) Calorific value and ash	48.00
g) Calorific value	22.50
h) Sulphur	22.50
i) Nitrogen content	34.00
j) Ash and moisture	28.50
k) Ash or moisture	14.50
2. Graphite	
a) Proximate analysis and sieve test	56.50
b) Refractories and heat insulating materials complete analysis	112.50

METALLOGRAPHIC EXAMINATION

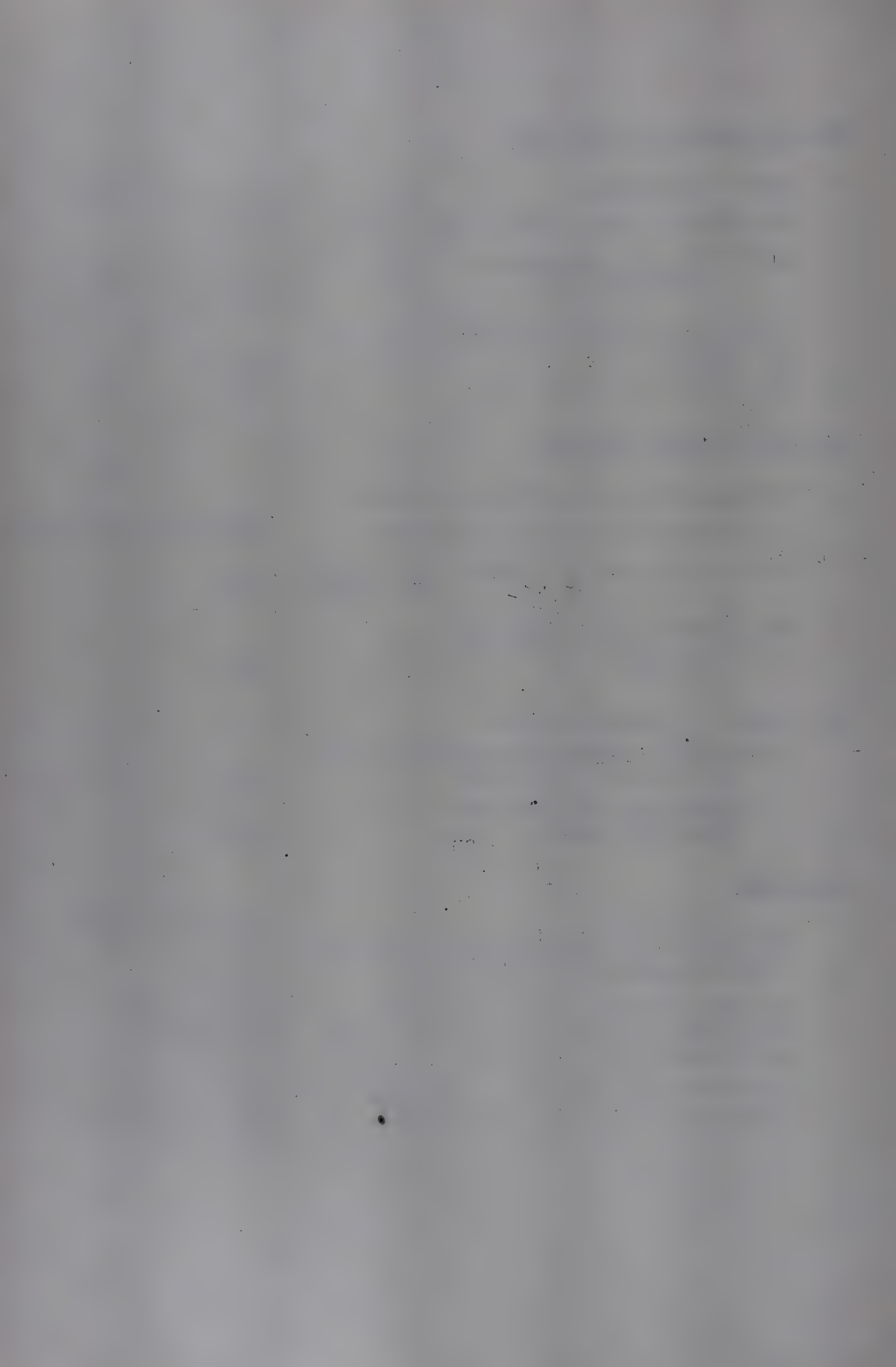
1. Macro examination	14.50 per sample
2. Microscopic examination per sample	25.00
3. Depth of case hardening or case carburization	25.00 per sample
4. Thickness of electro deposited coatings by microscopic examination per sample	25.00
5. Estimation of grain size	25.00

Non-destructive testing

a) Radiographic and ultrasonic tests	
i) Welded joints (per exposure)	37.50 per running ft.
ii) Castings and forgings (per square ft. area)	60.00
iii) Laminations in plates (per running yard or parts thereof)	37.50
b) Magnetic flaw detection	
i) Welded joints (per running yard or fraction thereof)	37.50
ii) Castings and forgings (per sq. yard)	37.50

Hardness

Micro hardness	45.00 per sample
Hardness by Vickers/Brinell/Rockwell (four impression on one piece)	17.50
Testing of minerals in mineral dressing process for beneficiation and upgrading of minerals and ores	Rates to be quoted on application
Analysis and testing of electroplating and anodising solutions	Rates to be quoted on application



ELECTRICAL ENGINEERING DEPARTMENT

Following is the list of equipment in Electrical Measurements Laboratory for conducting various tests as shown below:-

<u>EQUIPMENT</u>	<u>TESTS</u>
1. D.C. Potentiometer	Calibration of ammeter, Voltmeter and wattmeter (d.c)
2. Kelvin Double Bridge	Low resistance measurements
3. R.L.C. Bridge	For measurement of resistance inductance and capacitance
4. 3-phase Induction Regulator and Precision wattmeters	Calibration of 3-phase and 1-phase energy meters load
5. Ballistic Galvanometer and Hibbert Magnetic standard	For plotting B-H curve for ring specimen

Following tests were conducted in Electrical Measurements Laboratory:-

1. Checking calibration of Kelvin double bridge of Jaipur Metals and Electricals.
2. Measurement of resistance of ASCR conductor for R.S.E.B.
3. Certification of Incandescent lamps for Anand Lamp Works.
4. Certification of Tube-Light fixtures for Bajaj Electric Co.

1. Calibration of 3-phase
Induction Motor and
3-phase Induction
Motor and 3-phase
Induction Motor

2. Calibration of 3-phase
Induction Motor and
3-phase Induction
Motor and 3-phase
Induction Motor

3. Calibration of 3-phase
Induction Motor and
3-phase Induction
Motor and 3-phase
Induction Motor

4. Calibration of 3-phase
Induction Motor and
3-phase Induction
Motor and 3-phase
Induction Motor

5. Calibration of 3-phase
Induction Motor and
3-phase Induction
Motor and 3-phase
Induction Motor

6. Calibration of 3-phase
Induction Motor and
3-phase Induction
Motor and 3-phase
Induction Motor

7. Calibration of 3-phase
Induction Motor and
3-phase Induction
Motor and 3-phase
Induction Motor

8. Calibration of 3-phase
Induction Motor and
3-phase Induction
Motor and 3-phase
Induction Motor

9. Calibration of 3-phase
Induction Motor and
3-phase Induction
Motor and 3-phase
Induction Motor

10. Calibration of 3-phase
Induction Motor and
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Motor and 3-phase
Induction Motor

11. Calibration of 3-phase
Induction Motor and
3-phase Induction
Motor and 3-phase
Induction Motor

12. Calibration of 3-phase
Induction Motor and
3-phase Induction
Motor and 3-phase
Induction Motor

13. Calibration of 3-phase
Induction Motor and
3-phase Induction
Motor and 3-phase
Induction Motor

14. Calibration of 3-phase
Induction Motor and
3-phase Induction
Motor and 3-phase
Induction Motor

15. Calibration of 3-phase
Induction Motor and
3-phase Induction
Motor and 3-phase
Induction Motor

16. Calibration of 3-phase
Induction Motor and
3-phase Induction
Motor and 3-phase
Induction Motor

METALLURGICAL ENGINEERING DEPARTMENT

LIST OF TESTING EQUIPMENT

MINERAL DRESSING LABORATORY

1. Jaw crusher
2. Roll crusher
3. Disc pulveriser
4. Ball mill
5. Shaking table for fines
6. Centrifugal classifier
7. Air classifier
8. Rod mill
9. Mineral jigs
10. Flotation cells
11. Magnetic separator
12. Hydraulic classifier
13. Sieve shaker
14. Portable pH meter
15. Cross flow classifier
16. Double deck screen
17. Single deck screen
18. Thickner
19. Test sieves

PHYSICAL METALLURGY LABORATORY

1. Polishing machines
2. MIM-7 Vertical metallographical microscope
3. MIM-8 Horizontal metallographical microscope
4. Earichsen cupping test machine
5. Brinell-cum-vicker's hardness tester
6. Charpy-cum-izod impact tester

FOUNDRY LABORATORY

1. Permeability meter
2. Moisture teller
3. Green compression tester
4. Flowability indicator
5. Sieve shaker
6. Universal sand testing machine
7. Core hardness tester
8. Flowability
9. Clay determinator
10. Chill test apparatus

METALLURGICAL ANALYSIS LABORATORY

1. Carbon and sulphur determinator
2. Automatic single pan balance
3. Photo electric colorimeter
4. pH meter
5. Titration potentiometer
6. Turbidity meter
7. Conductivity meter
8. Electro gravimetric analysis apparatus
9. Polarograph
10. Steeloscope

PHYSICS OF METALS

1. Quartz tube dilatometer

NON DESTRUCTIVE TESTING LABORATORY

1. Flash point apparatus
2. Viscometers
3. Bomb calorimeter for solid and liquid fuels
4. Junker's calorimeter for gaseous fuels

HEAT TREATMENT LABORATORY

1. Optical pyrometer
2. Thermocouples and temperature indicators
3. Platinum resistance thermometer
4. Electrical heat treatment furnaces
5. Radiation pyrometer
6. Pyro optical pyrometer

GEOLOGY LABORATORY

1. Hardness boxes and streak plate for determining hardness of minerals
2. Jolly balance (sp. gr.)
3. Polarising microscope for identification of minerals and rocks
4. Steel yard balance
5. MIM-9 Ore microscope for identification of ore minerals

NOTE:- In addition to this, there are several other equipments and facilities available for carrying out tests.

1. 1000 cc balance (25.00)
2. 1000 cc balance (25.00)
3. 1000 cc balance (25.00)
4. 1000 cc balance (25.00)
5. 1000 cc balance (25.00)
6. 1000 cc balance (25.00)
7. 1000 cc balance (25.00)
8. 1000 cc balance (25.00)
9. 1000 cc balance (25.00)
10. 1000 cc balance (25.00)

HEAT TREATMENT EQUIPMENT

1. Optical pyrometer
2. Thermocouples and temperature indicator
3. Electrical heat treatment furnace
4. Radiation pyrometer
5. Pyro optical pyrometer

GEOLGY LABORATORY

1. Hardness boxes and steel plate for preparation of thin sections
2. 1000 cc balance (25.00)
3. 1000 cc balance (25.00)
4. 1000 cc balance (25.00)
5. 1000 cc balance (25.00)
6. 1000 cc balance (25.00)
7. 1000 cc balance (25.00)
8. 1000 cc balance (25.00)
9. 1000 cc balance (25.00)
10. 1000 cc balance (25.00)

GEOLGY LABORATORY

1. Optical pyrometer
2. Thermocouples and temperature indicator
3. Electrical heat treatment furnace
4. Radiation pyrometer
5. Pyro optical pyrometer

GEOLGY LABORATORY

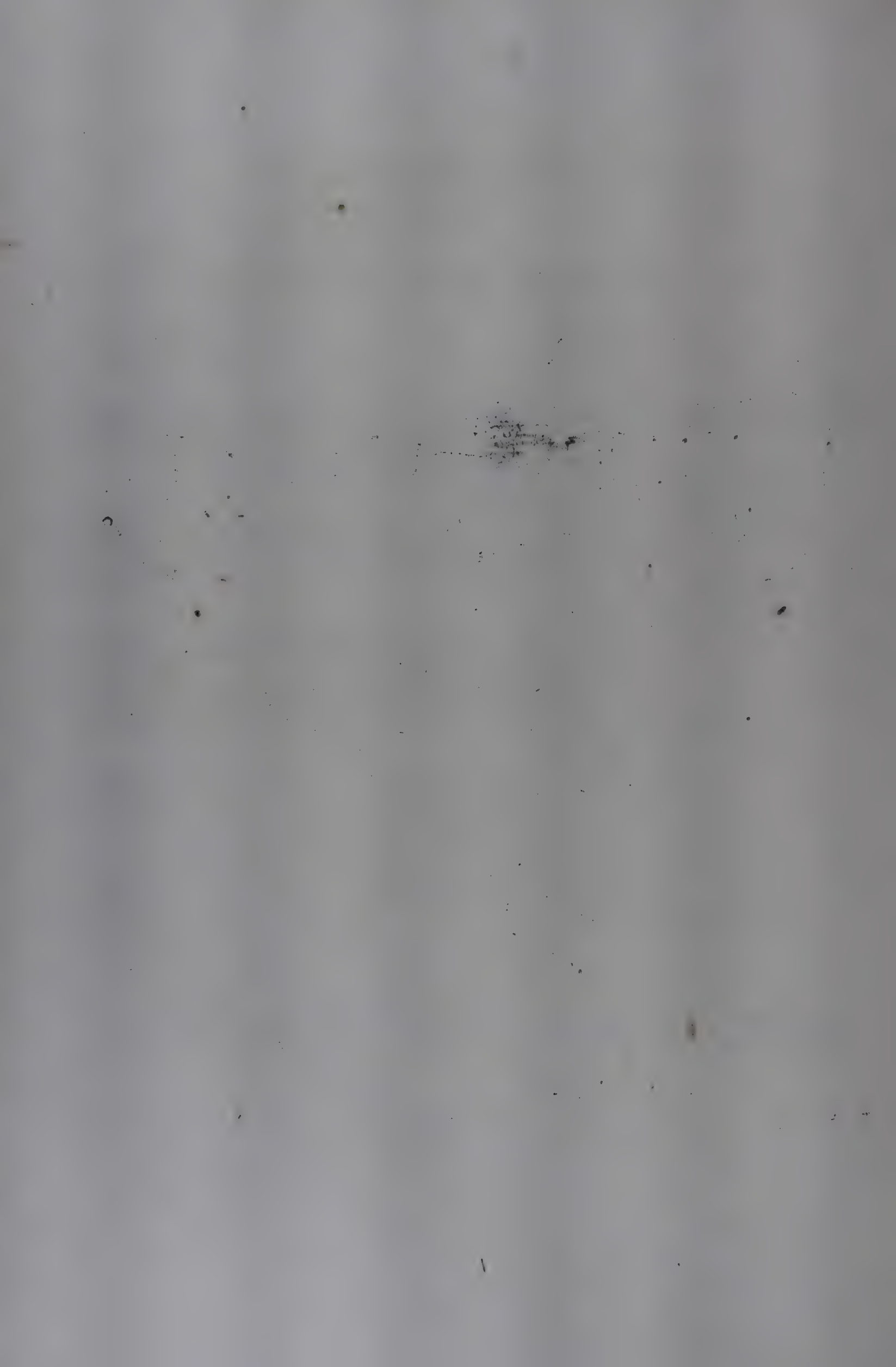
M.R. ENGINEERING COLLEGE, JAIPUR
Mechanical Engineering Department

SCHEDULE OF TESTING FEES

<u>S.No.</u> <u>(1)</u>	<u>Nature of work</u> <u>(2)</u>	<u>Charges (Rs.)</u> <u>(3)</u>
1.	Testing of Petrol and Diesel engines upto 19 M.P. at 3000 r.p.m. and upto 5 H.P. at 500 r.p.m. as per IS 1600 to IS 1604, 1960. Facilities exist for both constant and variable speed engines:	
	a) Acceptance test	300/- each
	b) Performance test	300/- "
2.	Testing of pressure vessels upto 30 kg/cm ² as per IS for unfired pressure vessels	300/- "
3.	Testing of air compressors upto a pressure of 7 kg/cm ²	150/- "
4.	Testing of Fans and Blowers:	
	a) Axial flow fans IS 3588-1966	300/- "
	b) Centrifugal fans IS 4844-1968	300/- "
5.	Testing of flash and fire points of lubricants according to IS, BS and ASTM specifications	25/- "
6.	Testing of fuel injector	5/- "
7.	Calibration of pressure gauge upto 400 kg/cm ²	25/- "
8.	Calibration of thermometer upto 500°C	25/- "

(1)	(2)	(3)
9.*	Alignment tests on machine tools as per I.S	
a)	Centre lathe IS 1879	300/-each
b)	Capstan and Turret Lathe IS:4537-1968	500/- "
c)	Shaper IS: 2310-1963	200/- "
d)	Milling machine	
	i) Horizontal and universal IS:2200-1962	500/- "
	ii) Vertical IS:2201-1962	500/- "
e)	Planer IS 2877-1964	300/- "
f)	Drilling machine	
	i) Box column IS 2367-1963	200/- "
	ii) Radial type IS:2199-1962	300/- "
	iii) Pillar type IS:2425-1963	
g)	Slotting machine IS 2308-1963	200/- "
h)	Bandsaw IS 3691	150/- "

* Alignment tests can be performed at the site of the factory, if desired.



M.R. ENGINEERING COLLEGE, JAIPUR
Mechanical Engineering Department

TEST FACILITIES AVAILABLE IN THE DEPARTMENT

1. Test bed for Internal Combustion Engines, alongwith all accessories for the test.
2. Testing of unfired pressure vessels upto 30 kg/cm^2 .
3. Testing of air compressors upto a delivery pressure of 7 kg/cm^2 .
4. Test rig for Fans and blowers.
5. Apparatus for testing flash and fire point of lubricants.
6. Diesel injector testing apparatus.
7. Pressure gauge calibration rig.
8. Set up for calibration of thermometer.
9. Facility for alignment tests on machine tools. The instruments and accessories required for alignment tests on various types of machine tools are available.

APPENDIX IV

Correspondence regarding setting up
of a
Regional Extension Centre of CLRI
in Rajasthan

APPENDIX IV

Copy of the letter No.1(15) 73-XTN dated 18th August, 1973 addressed to Shri Brij Raj Bahadur, Commissioner State Enterprises, Rajasthan, Jaipur, by Shri A.Ganesan, Central Leather Research Institute, Adyar, Madras-20

...

Dear Sri Brij Raj Bahadur,

Please refer to your D.O.letter dated 25th June, 1973, addressed to Dr.Nayudamma, DGSIR regarding setting up of CLRI Extension Centre in Tonk. Your request will be placed before the Committee appointed by the DGSIR headed by Dr.G.S.Sidhu, Director, Regional Research Laboratory, Hyderabad, who will consider such requests

With kind regards,

Yours sincerely,

sd:

(A.Ganesan)

Copy of the letter No.DG/PS/73/1268 dated 5th July, 1973 addressed to Mr.Brij Raj Bahadur, Commissioner State Enterprises, Jaipur, by Dr.Y.Nayudamma, DG, CSIR, Rafi Marg, New Delhi

...

Dear Mr.Bahadur,

I thank you very much for your D.O.No.213/~~PA~~/SSE.173 dated 28th June, 1973.

I am passing on your letter to the Scientist-in-Charge, Central Leather Research Institute, Madras to respond to your request.

With kind regards,

Yours sincerely,

sd:

(Y.Nayudamma)

Copy of the letter No.994 dated 17th July, 1973 addressed to the Director, Central Leather Research Institute, Adyar, Madras-20 by the Senior Accounts Officer-cum-Secretary of the Rajasthan State Tanneries Ltd., Jaipur, Rajasthan.

...

Dear Sir,

As you are aware, we are embarking upon a project for setting up a leather tannery at Tonk in the public sector for manufacture of finished leather. This will be an export-oriented unit.

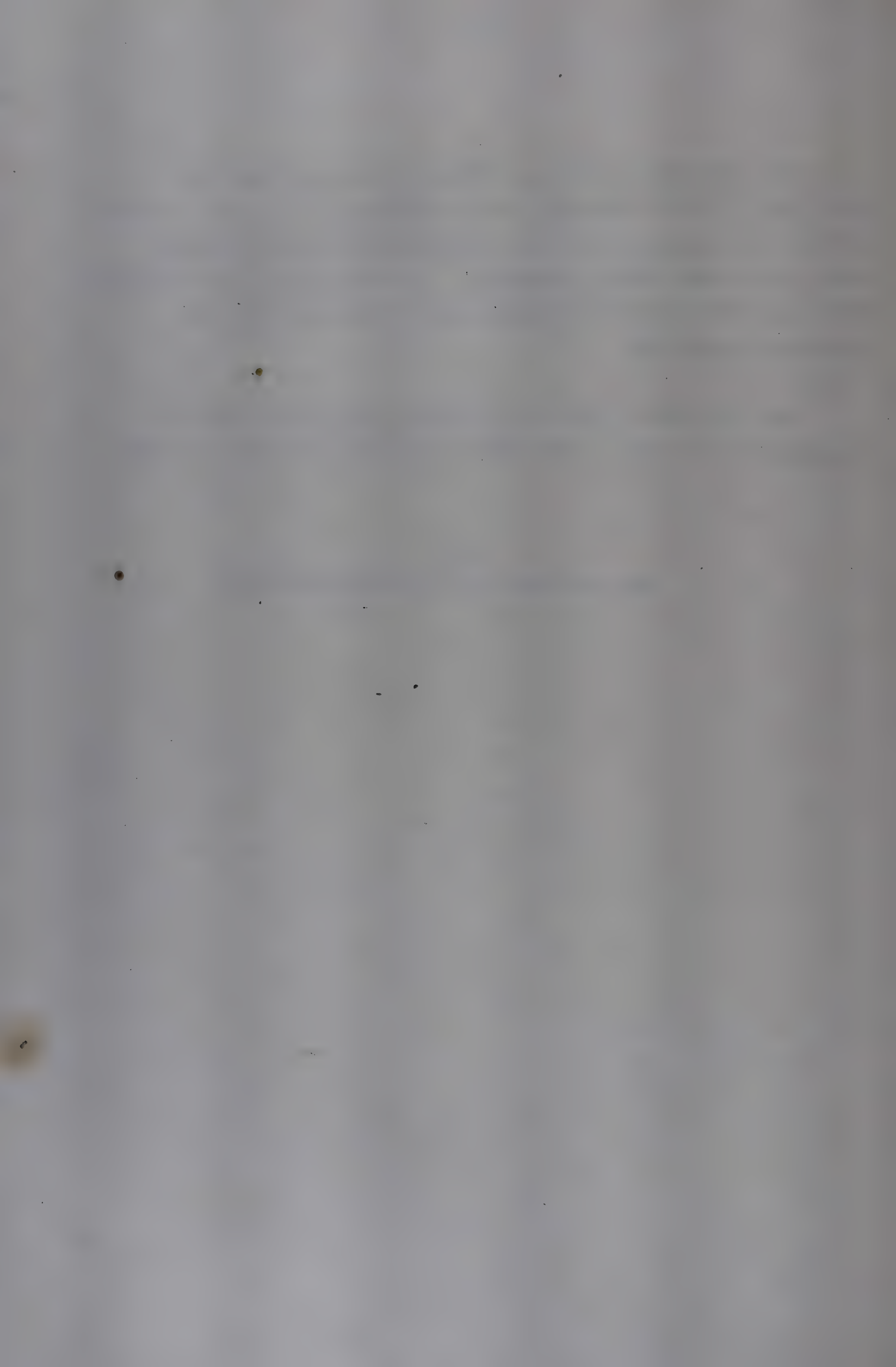
Ours will be the first tannery in Rajasthan. So far, almost all the raw skins and hides of Rajasthan are being exported to other States for processing. In order that requisite technical guidance is available to the tannery from an Institute like yours and research efforts based on local qualities and conditions are made to ensure quality production, it is requested that a CLRI research station may be considered to be established at Tonk. Such a centre would also help train the technical staff in the improved techniques of processing etc. The research station could concentrate, in the first instance, an improvement of quality of raw skins, and hides and improved methods of preservation in raw state. Rajasthan is a backward State where tanning is being adopted as an industry for the first time (tanning being done so far on small scale basis only by the local people). As such, on-the-spot technical guidance from a research station of CLRI may be considered as desirable.

The proposed station could be set-up within the premises of Tonk tannery so that there is ease of communication and facilities like electricity, water, housing etc., are more easily managed. We are prepared to provide the required land and laboratory facilities for the research station.

We hope that you will consider the above request earnestly and take a favourable decision at the earliest

sd:

Sr.Accounts Officer-Cum-Secretary



Copy of the D.O. letter No. 213/PA/SSE/73 dated 28th June, 1973 addressed to Dr. Nayudamma, DG, CSIR, Rafi Marg, New Delhi by Shri Brij Raj Bahadur, Commissioner State Enterprises, Rajasthan, Jaipur

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Dear Dr. Nayudamma,

This letter contains two proposals for your kind consideration.

(i) We have discussed with CLRI Officers the desirability of establishing a CLRI Station in Tonk. Initially this Station could concentrate upon improvement of the quality of raw hides and skins and improved methods of preservation in raw state. The local officers of CLRI have no objection to such a station being established, but have stated that this would need a decision from the CSIR. I shall be grateful if you will kindly consider this and if possible, sanction the setting up of a station of CLRI at Tonk. This station could be set up within the premises of Tonk Tannery, so that there is ease of communication and some facilities such as electricity, water, officer's quarters etc., are more easily managed.

(ii) The second proposal is that we may be loaned the services of Shri P.S. Venkatachalam, Scientist in the CLRI to function as Leather Technologist for a period of two years in the first instance. We have discussed the matter informally with Shri Venkatachalam and he has stated that he would, prima-facie, have no objection to coming on deputation subject to your advice and directions in

the matter. We feel that Shri Venkatachalam's association as Leather Technologist would give us the following immediate advantages:

- (a) We would have a senior staff member with working experience for tannery
- (b) We would be able to establish very much quicker liaison with the proposed leather authority as Shri Venkatachalam was the member of Seetharamiah team
- (c) Foreign buyers, whom we intend to contact, a few months prior to going into actual production would be very much more impressed by Shri Venkatachalam's abilities than any discussion, we initiate at present.

If these proposals are acceptable to you in principle, I would be extremely grateful for your kind advice in the matter.

Thanking you,

Yours sincerely,

sd:

(Brij Raj Bahadur)

Copy of the letter No.3153/74 dated 5th February, 1974 addressed to Dr.G.S.Sidhu, Director, RRL, Hyderabad by Shri J.S.Singhvi, Managing Director, The Rajasthan State Tanneries Limited, P-6, Tilak Marg, 'C' Scheme, Jaipur

...

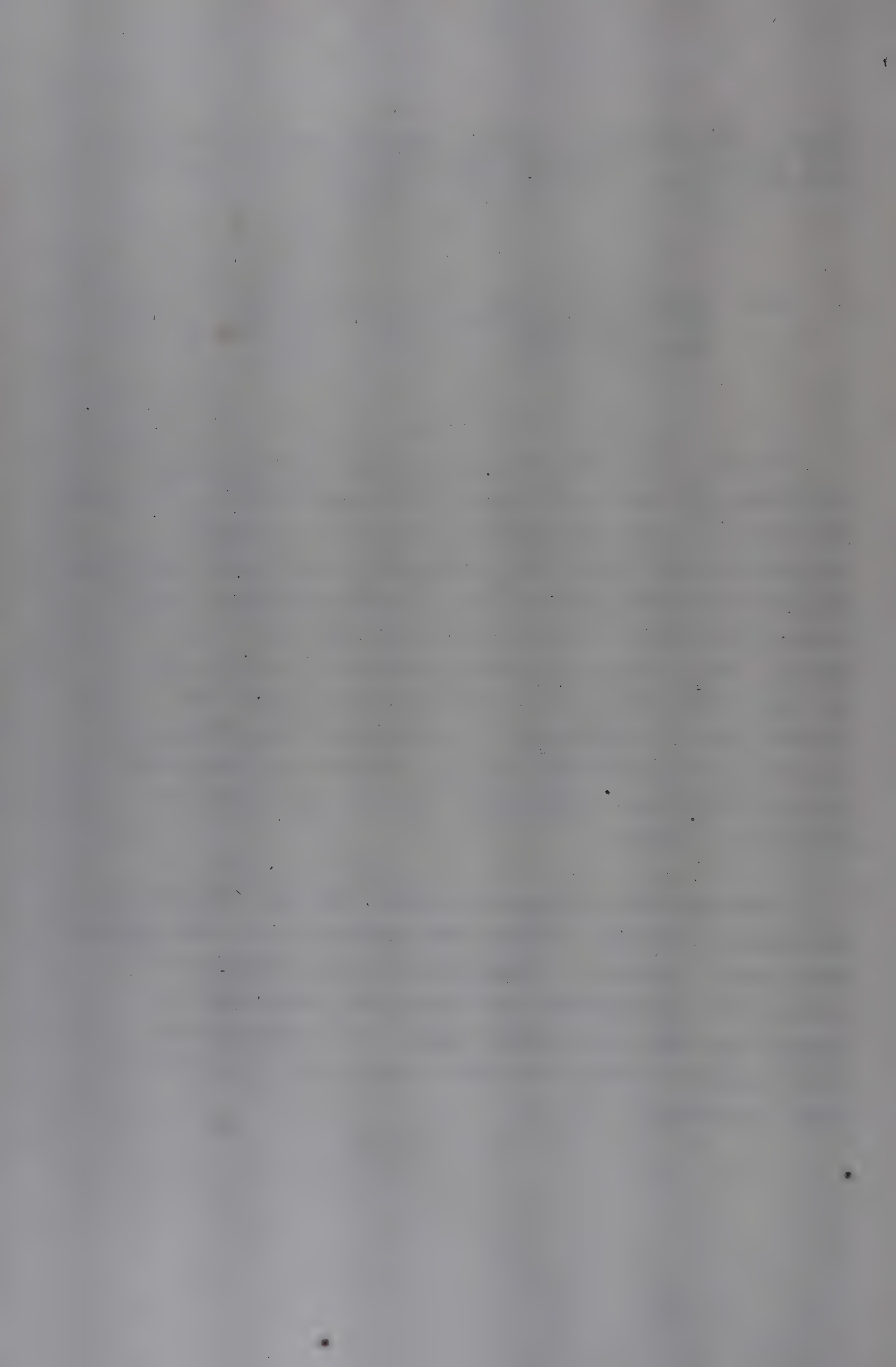
Dear Dr.Sidhu,

You will recall that my predecessor Shri Brij Raj Bahadur had discussed with you the question of establishing a Research Extension Unit of CLRI at Tonk at New Delhi on 24th January, 1974. Since Shri Brij Raj Bahadur has been transferred as the Managing Director of Rajasthan Financial Corporation, it is my privilege to pursue this matter with you. You will agree that the establishment of a research station in Rajasthan is important not only for providing technical guidance to the tannery workers, but also for carrying out research efforts based on local qualities and conditions to ensure quality production of finished leather in the Rajasthan State Tanneries. We would be glad to provide necessary land for the Research Centre within the premises of our tannery and other facilities to ensure proper functioning of the research unit.

We shall be grateful if our proposal could be considered favourably and a decision conveyed at the earliest.

With regards,

Yours sincerely,
sd:
(J.S.Singhvi)



Copy of the D.O. letter No.12(1)/74-XTN dated 21st January, 1974 addressed to Dr.G.S.Sidhu, Director, RRL, Hyderabad by Prof.M.Santappa, Director, CLRI, Madras

...

Sub: Setting up of Extension Centres by
National Laboratory/Construction of
Permanent Buildings thereof - Reg.

...

You are aware that this Institute has at present five Regional Extension Centres located at Bombay, Calcutta, Jullundur, Kanpur and Rajkot. While the centres at Jullundur, and Kanpur are located in Governmental Buildings, the other Centres are housed in rental buildings only. These Centres have been in existence for more than 10 years. Even though, they were originally established on temporary basis, their existence have proved to justify their continuation on permanent basis. Hence, it would be appropriate if these centres are housed in our own buildings constructed for the purpose at the respective places.

Recently we have also received requests from the Government of Madhya Pradesh and Rajasthan for establishing additional centres in those States. Establishment of additional centres was also emphasised in Science and Technology plan for leather which was formulated by NCST group on leather and also proposed in CLRI Fifth Plan proposals.

You are also aware that most of the National Laboratories have established Regional Centres in different States in India. It would, therefore, be ideal if all such centres are located at one place by constructing a complex like the one functioning at Madras.

As far as CLRI is concerned our requirement of space for each centre will be about 1400 sq.ft. In fact, in the Fifth Plan proposals, a provision of Rs.24,500 lakhs is also made for constructing buildings for our centres. It is presumed that the Committee under your Chairmanship have already considered these aspects also while formulating your recommendations on the subject and if not, we would appreciate if your Committee considers these issues. In case, the matter has to be taken up with the Council direct, please do advise us.

We shall be thankful for your early reply in the matter.

Yours faithfully,

sd:

(M.Santappa)

Copy of D.O.Letter No.SCI-T-703/3901-03 of 14th February, 1974 from Dr.G.S.Sidhu, Director, RRLH addressed to Prof. Y.Nayudamma, DGSIR, New Delhi.1

Sub: Setting up of CLRI Extension Centre at Tonk

Dear Prof. Nayudamma,

Kindly refer to your letter No.DG/PS/73/1208 dated 5th July,1973 to Shri Brij Raj Bahadur.

Shri Brij Raj Bahadur met me in this connection in Delhi on the 25th January, 1974 and showed me the correspondence with you and the CLRI. Our Committee was not specifically aware of this request earlier. We have now considered this along with other requests, and will be sending our interim recommendations on 'setting up of extension centres' shortly.

In the meanwhile, in our opinion, the CLRI extension centre in Tonk would serve a useful purpose and we recommend that it may be set up by CLRI. I am endorsing a copy of this letter to Prof.Santappa.

Kindly also note that Shri Brij Raj Bahadur has now been transferred as the Managing Director of the Rajasthan Financial Corporation and has been succeeded by Shri J.S.Singhvi as the Managing Director of the Rajasthan State Tanneries Limited. I enclose

a copy of my letter to Shri Singhvi for your kind information.

With kind regards,

Yours sincerely,

sd:

(G.S.Sidhu)

c.c. Prof. M. Santappa, Director, CLRI, Adyar,
Madras-600020

Dr. B. L. Amla, Acting Director, CFTRI, Mysore-13

Copy of D.O.letter No.Sci-T-703/3906 of 14th Feb.1974 from Dr.G.S.Sidhu, Director. RNLH addressed to Shri J.S. Singhvi, Managing Director, The Rajasthan State Tanneries Ltd., P-6 Tilak Marg 'C' Scheme, Jaipur-302005

...

Dear Shri Singhvi,

Sub: Establishment of a Research Extension Centre of CLRI at Tonk

Kindly refer to your letter No.3153/74 dated 5th February, 1974.

We have, today, sent our recommendations on the establishment of an extension centre of Central Leather Research Institute to the Director-General, CSIR and Director, Central Leather Research Institute.

With kind regards,

Yours sincerely,

sd:

(G.S.Sidhu)

Copy of D.O.letter No.DG/PS/74/870 of 19th Feb.1974
from Prof.Y.Nayudamma, Secretary to the Govt.of India &
Director-General, CSIR, New Delhi addressed to Dr.G.S.Sidhu,
Director, RRL, Hyderabad.

....

Dear Dr.Sidhu,

Thank you very much for your D.O.letter No.
SCI-T-703/3901 dated the 14th February 1974 and noted
the contents therein.

Action is being taken on it.

With kind regards,

Yours sincerely,

sd:

For Y.Nayudamma

APPENDIX V

Correspondence with Kerala Government

APPENDIX V

Copy of the D.O.Letter No.7/30/73-L dated July 12, 1973 from Shri Baldev Singh, Scientist-in-Charge, RCIL Division, Council of Scientific & Industrial Research, New Delhi-1, addressed to Dr.G.S.Sidhu, Director, Regional Research Laboratory, Hyderabad-9 and copies with enclosures endorsed to Dr. B.L.Amla, Scientist-in-Charge, CFTRI, Mysore-2 and Shri Bharat Bhushan, Scientist, RRL, Hyderabad.9.

Dear Dr. Sidhu,

In continuation of DG's meeting with Shri Achutha Menon, Chief Minister, Kerala, regarding the question of assistance by CSIR and its laboratories in the industrial and economic development of the State, a meeting was organised with the State Government officials and industrialists by the Secretary, Industries Department, Government of Kerala on 21st June 1973. The meeting was attended by me on behalf of the CSIR. I enclose a copy of my report submitted to DG for your information. I am requesting Shri K.Narayanan, Secretary, Industries Department, to send you a copy of the minutes of the meeting when finalised.

With kind regards,

Yours sincerely,

Sd/-

(BALDEV SINGH)



RESEARCH COORDINATION & INDUSTRIAL LIAISON

Report of the visit to Trivandrum
for discussions with the officers
of the Industries Department, Govt.
of Kerala and Industrialists

(June '20-21, 1973)

D.G. might recollect that there has been some correspondence with the Chief Minister, Kerala State, in regard to the setting up of an Extension Centre of the CMERI, a Regional Research Laboratory and a Centre of the CGCRI etc. D.G. had also met Shri Achuta Menon. Subsequently, we had sent copies of the note compiled on the basis of suggestions of the Directors as to what CSIR and its laboratories can do for Kerala. At the invitation of the Secretary, Industries Department, Govt. of Kerala, I visited Trivandrum on 20th and 21st June 1973 for a preliminary discussion with the officials of the Industries Department and industrialists. While the detailed proceedings will be available when the minutes are received from the Govt. of Kerala, I am giving a preliminary report for DG's information.

Recently, Shri K.Narayanan, IAS, has taken over as Secretary, Department of Industries. He is a youngman of considerable initiative and energy. The meeting was attended by the Director of Industries, Joint Director of Industries, Director of the Industrial Research and Testing Institute, Dr.P.T.Joseph (who is also the Secretary of the Science & Technology Committee); Shri Kadar Kutty, a prominent industrialist and Chairman of the West Coast Paper Mills (he has a number of plywood industries and other concerns); representatives of the Kerala Drugs and Pharmaceuticals Ltd., Travancore Titanium Limited, Travancore Chemicals Ltd., FACT, Dr. V. Ranganathan (formerly Secretary, Cost and now Consultant to Mr.Kadar Kutty), representatives of the Department of Technical Education; representatives of

the Holding Company which looks after the financing and management of the public sector concerns and some others. Most of the discussions were based on the notes already sent by the Directors. At my request Dr. George of NIO Cochin Centre had also come.

Shri Narayanan introduced the subject and mentioned that there is an urgent need for a laboratory for testing and development of the ample resources of the State which consisted amongst others cash crops, i.e. cashew, rubber, coconut, plywood as also valuable minerals including ilmenite, mica and graphite. He said that till now they have to go out of the way to either Bangalore and other national laboratories and this causes not only delay but at times no response. He thanked the CSIR for taking initiative and invited the persons present to express their views.

Shri Kadar Kutty based himself on the NCL paper and said that the Government should go in a big way to industrialise the State. For that purpose a full-fledged R & D backing was desirable. He particularly referred to the agro-wastes, coir pith, timber wood of more than 500 species, arecanut wastes, rubber wood waste and several other agro-wastes. He also referred to the need for concentration of a major wealth of Kerala, viz., the essential oils, species and medicinal plants. Dr. Ranganathan supplementing the remarks said that no body knows about the quality of mica or extent of its occurrence. He also referred to the need for utilisation of byproducts of cashewnut.

The Managing Director of the Kerala Drugs & Pharmaceuticals referred to the fact that Kerala was a major producer of lemongrass oil but was not using it to manufacture betaionone or Vitamin A for which the know-how can be provided by NCL. He also said that Kaoline could also be manufactured to meet the requirements of the country.

A major discussion arose of Travancore Titanium. Kerala has the largest deposits of the raw material in the entire South-East Asia. Work had been sponsored some time back by the firm in NCL & AEC. They also have done some work themselves. However, they were not satisfied and were wanting collaboration with Mineral Research Development Corporation of Australia. I suggested that before they take a firm decision, it might be useful to have a round-table discussions on the subject. The Managing Director pointed out that what they needed was the entire gamut of operations and not only research and development. They also wanted design of the plant and machinery. He agreed that it will be useful if a task project could be initiated on this. He also referred to the need for further work on zirconium and other available materials. This was supported by the representatives of the Kerala Minerals and Metals Corporation.

Mr. Pir Mohd., Chairman of the Holding Company said that the purpose would be served if the CSIR could set up a Madras type of Complex or a Regional Laboratory with clearly defined divisions on Minerals, Agro-wastes and Essential Oils, Medicinal plants to start with. He also referred to the need for research on oceanographic aspects.

The Director of Industries and Dr. P.T. Joseph, Director of the Industrial Research Laboratory pointed out that already a laboratory existed in the State which should be taken as a nucleus. The laboratory had a total complement of 70 persons and it had done good amount of work on some of the items mentioned by members present. What was needed was the organisational and financial assistance by the State Government, Central Government or the CSIR. He did not

think that it will help to set up another laboratory when some work was already being done. They had requested for a grant of Rs.12.5 lakhs also applied the UNDP but there had been no response. They also wanted some Fellowships or Pool Officers who could further augment the small group of scientists. Intervening I suggested that the members may react to the remarks of Dr. Joseph.

The Chief Conservator of Forests said that they treated the forests for wood and timber but were not conscious of the other forest resources. He referred to the need for work on other forest resources to produce hard boards, densified wood for radial blocks and fibre etc. The Director of Technical Education said that although the talent in Kerala was very good but this had only led to increasing unemployment. He would welcome setting up of a MERADO or CMERI centre who could train the staff for becoming consultants and giving engineering designs. He was not quite sure if all the suggestions could be put in a single laboratory. Shri Kadar Kutty said that he would not like the CSIR to feel shy of coming in a big way simply because Dr. Joseph had a laboratory. He said that the effort was totally inadequate and a massive R & D support particularly for design development and engineering was required. Shri Narayanan said that the R & D needs could only be met by a central R & D Institute. We may have to examine as to what were the actual needs of R & D, whether there was an agency to utilise this R & D and whether there need for an agency like the CSIR to give a massive support. He said that the efforts of Dr. Joseph could not fructify in the absence of pilot plant, design engineering facilities. He was of the view that unless the CSIR comes in to support in a big way, the task would not be accomplished. He particularly referred to the position of cashew oil, lemon grass



oil, titanium, rubber, ceramic and glass as the major subjects on which the laboratory should be based. The agro-wastes should also take into account coconut and cashew shell. Dr. Ranganathan said that the existing laboratory could be developed as a testing and quality control laboratory for the industry. At the invitation of the Secretary, Industries, I summarised the discussion and made the following suggestions:

- i) A good case had been made for setting up a mechanical engineering centre;
- ii) There was a communication gap for which an information network under the Secretary, Industries would be useful. This information centre could be set up jointly by the industry, the CSIR and the State Government;
- iii) The question whether a Regional Laboratory of the CSIR complex should be set up should be discussed further by a larger group of industrialists. If possible a conference of industrialists should be invited for a day which should be attended, if possible, by the Director General, CSIR who could then form a firsthand opinion as to what is the best way. The industrialists could also have across the table discussions with the DGSIR and other Directors from the laboratories. This could be done some time in August. Later the DGSIR and if possible Shri C. Subramaniam could have a further discussion with the Chief Minister and other people to consider the manner in which the CSIR could be of assistance to Kerala State.

The above suggestions were agreed to and further action will be taken by Secretary, Industries Department, Government of Kerala.

D.G. may kindly see.

Sd/- Baldev Singh
23/6/73

DG

Sd/- Y. Nayudamma
25/6

Record of discussions with Industrialists held at 10.30 am
on 21-6-1973

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The following were present:-

1. Dr. Baldev Singh,
Scientist-in-Charge,
RCIL Division,
Council of Scientific & Industrial Research,
New Delhi.
2. Shri K.Narayanan,
Secretary to Government,
Industries Department,
Secretariat, Trivandrum.
3. Shri P.D. Kuruvilla,
Director of Industries & Commerce,
Trivandrum.
4. Dr. P.T. Joseph,
Director,
Industrial Testing & Research Laboratory,
Trivandrum.
5. Shri S.Peer Mohammed,
Mg. Director, Kerala State Industrial
Enterprises Ltd., Trivandrum.
6. Shri C.P. Kuriakose,
Director of Technical Education, Trivandrum.
7. Shri Kurian Thomas, V.,
Jt. Director, Technical Education, Trivandrum.
8. Dr. K.J. Joseph,
Dy. Conservator of Forests, Trivandrum.
9. Dr. V.S.Vijayan Nayar,
Research & Development Officer,
Travancore Titanium Products Ltd.,
Trivandrum.
10. Shri A.K. Kaderkutty,
Western India Plywoods Ltd.,
Baliapattam.

11. Shri V. Ranganathan,
Western India Plywoods,
Baliapattam.
12. Shri M. Narayanan,
Managing Director,
Kerala State Drugs & Pharmaceuticals Ltd.,
Alleppey.
13. Dr. K.A. Jose,
Deputy Director,
C.F.S.C., Changanacherry.
14. Shri P.O. Titus,
Managing Director,
Kerala Minerals and Metals Ltd.,
Quilon.
15. Dr. M.J. George, R.C. of N.I.O., Cochin.

The Secretary (Industries) introduced Dr. Baldev Singh, Scientist-in-Charge, RCIL Division, Council of Scientific and Industrial Research to the gathering of Industrialists. He mentioned that there is an urgent need for a Laboratory for testing and development of the resources of the State, consisting amongst others of cash crops like Cashew, Rubber, Coconut, Plywood and other valuable minerals like ilmenite, mica, graphite and high grade clay. It was pointed out that the Industrialists of the State have to go to various places outside Kerala for any of their problems to be studied in the Research Laboratories, with the result that there is lot of delay and quite a number of times, no response. The background of starting negotiations between the State Government and the C.S.I.R. was explained at the conference. While thanking the C.S.I.R. and the Director General of the C.S.I.R. in particular for taking the initiative to strengthen the Industrial Research base in the State, the Secretary Industries invited the members present to give

their opinions and concrete suggestions for the establishment of research facilities in the State. While requesting members to give their views in the matter, it was pointed out by the Industries Secretary that the Director General of the C.S.I.R. was very particular that in the State, both the State Government and the Industrialists of the State should be fully involved.

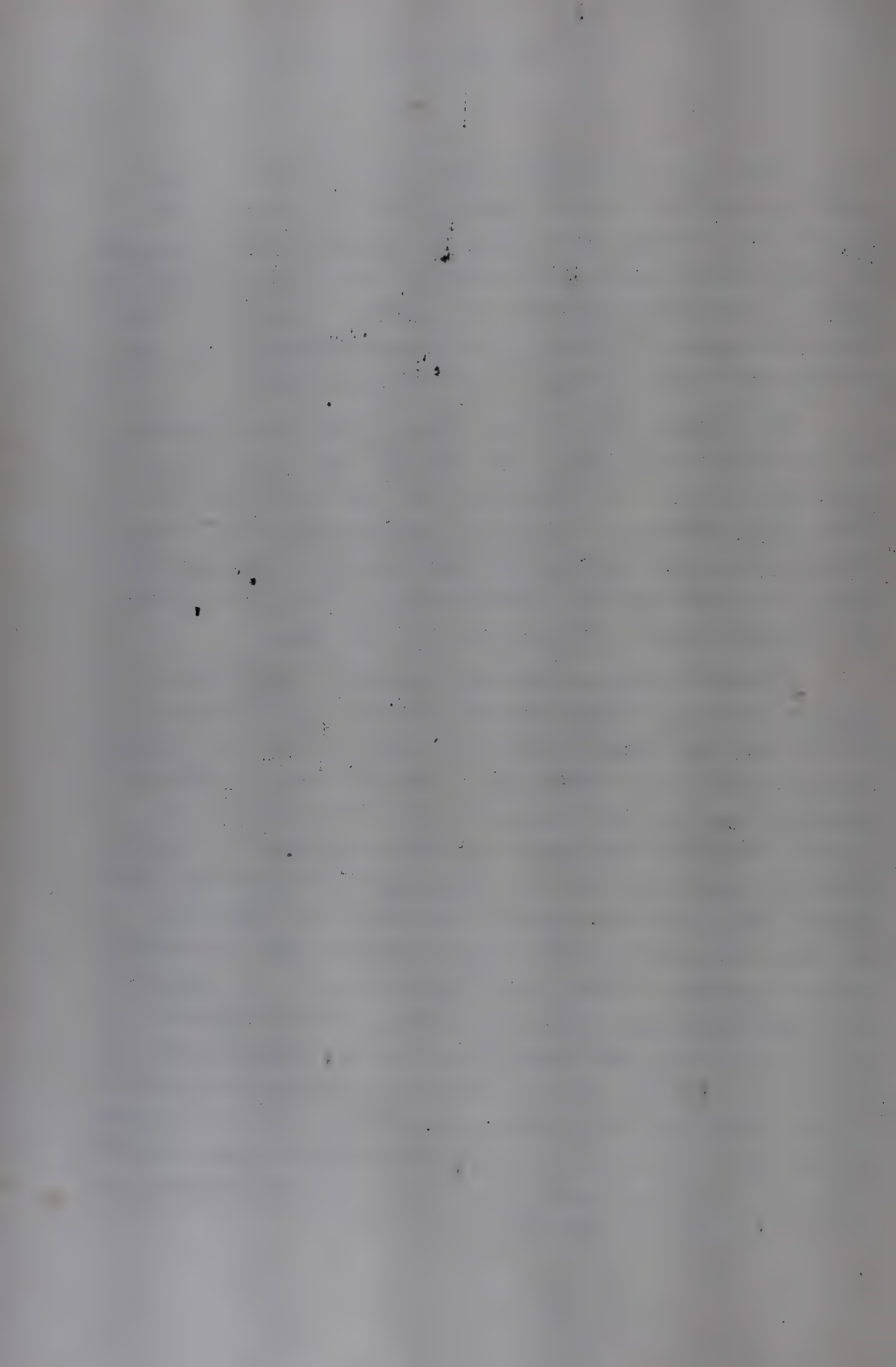
Shri A.K. Kaderkutty initiated the discussion by stating that what was required in Kerala was a fullfledged Regional Laboratory which will have a design and development centre as well. For industrialising the State of Kerala in a big way, this was a must. There was immense possibility for the establishment of Petro-Chemical Complex, various Agro-based Industries, Forest Industries, etc. He particularly pointed out that though our forests were rich with more than 500 species of wood only 40 to 50 species have been exploited so far. According to him the main reason why the natural resources of Kerala have not been fully exploited for Industrial purposes is the lack of research and development facilities which void should be immediately filled up by setting up a full-fledged Regional Laboratory and this should be done by C.S.I.R. Dr. V. Ranganathan supplementing the remarks of Shri A.K. Kaderkutty, pointed out that the quality of mica and the extent of its occurrence in Kerala have not been fully established. He also referred to the need for utilisation of by-products of Cashew nuts.

Shri M. Narayanan, Managing Director of Kerala State Drugs & Pharmaceuticals Ltd., referred to the fact that Kerala was a major producer of lemon grass oil but was not using it for the manufacture of Betaionione or vitamin 'A' for which the know-how can be provided by N.C.L. Sutures

with needle is an item which could be produced in large quantity in Kerala but we must evolve the know-how. We need a full-fledged laboratory to process our own know-how. The Laboratory should be equipped to set up pilot projects after a particular know-how is evolved. According to him there is immense possibility of manufacturing the Kaoline to meet the requirements of the entire country.

Dr. Vijayan Nair of the Titanium Products pointed out that the iron part of the mineral sand has not been fully exploited. The effluent from the T.T.P. unit has to be fully utilised. There is possibility for starting electronic grade Titanium dioxide as well as pharmaceutical grade titanium dioxide. For all these there is necessity for applied research to be done in a big way.

Shri P.O. Titus, Managing Director, Kerala Minerals and Metals Ltd., Quilon referred to the use of zircon. Kerala has the largest deposit of raw material for titanium in the entire South East Asia. Work had been sponsored sometime back by the Travancore Titanium in N.C.L. and A.E.C. They also had done some work themselves. However, they were not satisfied and they wanted collaboration with Mineral Research Development Corporation of Australia. At this stage, Dr. Baldev Singh suggested that it might be useful to have a round table discussions on the subject. The representative of the Travancore Titanium Products pointed out that what they needed was the entire gamut of operations and not only research and development. They wanted design of the plant and machinery. He also referred to the need for further work on Zirconium and other available material. This was again supported by representatives of the Kerala Minerals and Metals Ltd.



Shri S. Peer Mohammed, Managing Director, Kerala State Industrial Enterprises Ltd., pointed out that the purpose would be served if the C.S.I.R. could set up a Madras type of Complex or Regional Laboratory with clearly defined Divisions of Minerals, Agro-based Industries, Essential Oils, and Medicinal Plant. He also pointed out that Oceanographic aspects also should be provided for.

The Director of Industries & Commerce pointed out that it would be ideal if they could have an apex sort of institution catering to smaller units of research. This institution should be linked with industry, both organisationally and financially. He also pointed out that without the C.S.I.R. coming in a very big way this cannot be achieved.

Dr.P.T. Joseph, Director of Industrial Testing and Research Laboratory, Trivandrum gave an outline of the Research activities carried out by this institution. In the Food Technology Section, economic methods for the manufacture of glucose and alcohol from tapioca and spoiled rice had been developed. An effective method for the safe preservation of toddy for several weeks had been worked out. The manufacture of agar-agar and alginic acid from sea-weeds had succeeded and reached the commercial stage.

The Forest Technology Section had developed an effective method for the chemical extraction of tannin from cashewnut testa and from coconut husk. Durable hard boards and partition boards were prepared from African Payal, bagasse and other cheap materials. Methods were devised to use lemon grass oil to make perfumes and pharmaceuticals.

In the Plastic Technology Section, successful experiments were conducted to make resins, paints, varnishes, etc. from cashewnut shell liquid. This had reached the pilot plant stage. Similarly rubber seed oil could be used for making soaps, emulsions etc.

The Mineral Technology Section concentrated its attention on the beach minerals like ilmenite, monozite, zircon, etc. and succeeded in preparing several industrially valuable products.

Thus the Industrial Testing and Research Laboratory deserves by its activities and achievements to be upgraded into a Regional Laboratory. It is very well equipped and offers a lot of scope for expansion.

The Committee for Science and Technology appointed by Government, realised the immense possibilities for industrial research by the upgradation of this Laboratory. A sum of Rs. 100 lakhs has been allocated for the expansion of this laboratory during the Fifth Five Year Plan. The only stipulation made is that it should become, like the Institute for advanced Economic Studies or the Shri Chithra Thirunal Medical Centre for Advanced Research, an autonomous institution which will attract the best talents.

This laboratory like the former Industrial Research Laboratory of Hyderabad can serve as a nucleus or starting point for development to the status of a Regional Laboratory with the co-operative efforts of the Central and State Governments and C.S.I.R. Other units can be added subsequently to form even a complex. Thus the expansion and upgradation of the laboratory to the status of a Regional Laboratory with the co-operation of C.S.I.R., but under the control of a governing body appointed by the State Government of Kerala to give it the higher stature of an autonomous

institution seems to be the most appropriate step for effective service for the industrial progress of Kerala. This has to be achieved during the Fifth Plan Period.

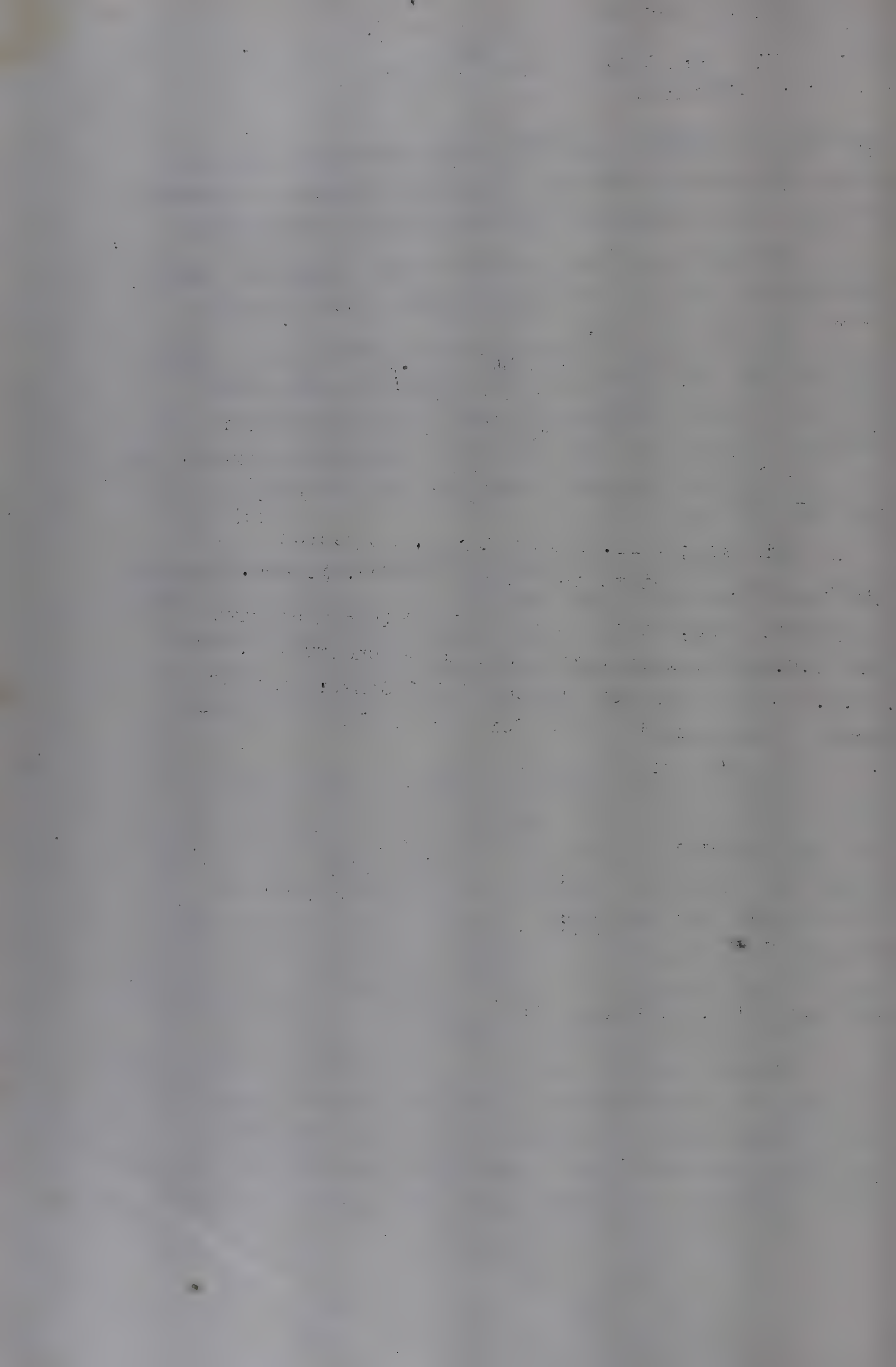
At this stage, Dr. Baldev Singh, suggested that the members may react to the remarks of Dr. Joseph.

Dr. M. Jose, stated that fellowship can be given by C.S.I.R. and market survey should be undertaken. Dr. K.J. Joseph representing the Chief Conservator of Forests referred to the need for work on Forest Resources to produce hard boards, densified wood for radial blocks and fibre, etc.

The Director of Technical Education, Dr. Kuriakose said that he would very much welcome setting up of MERADO or CMERI centre which could train staff for becoming consultants and giving engineering designs. He was not quite sure if all the suggestions should be put in a single laboratory.

Shri A.K. Kaderkutty, reacting to the remarks of Dr. Joseph, pointed out that the C.S.I.R. should start its own Regional Laboratory and not merely upgrade the existing Industrial Research and Testing Laboratory at Trivandrum. He said that the effort in the Industrial Research and Testing Laboratory was totally inadequate and massive Research and Development support, particularly for design development and engineering was called for.

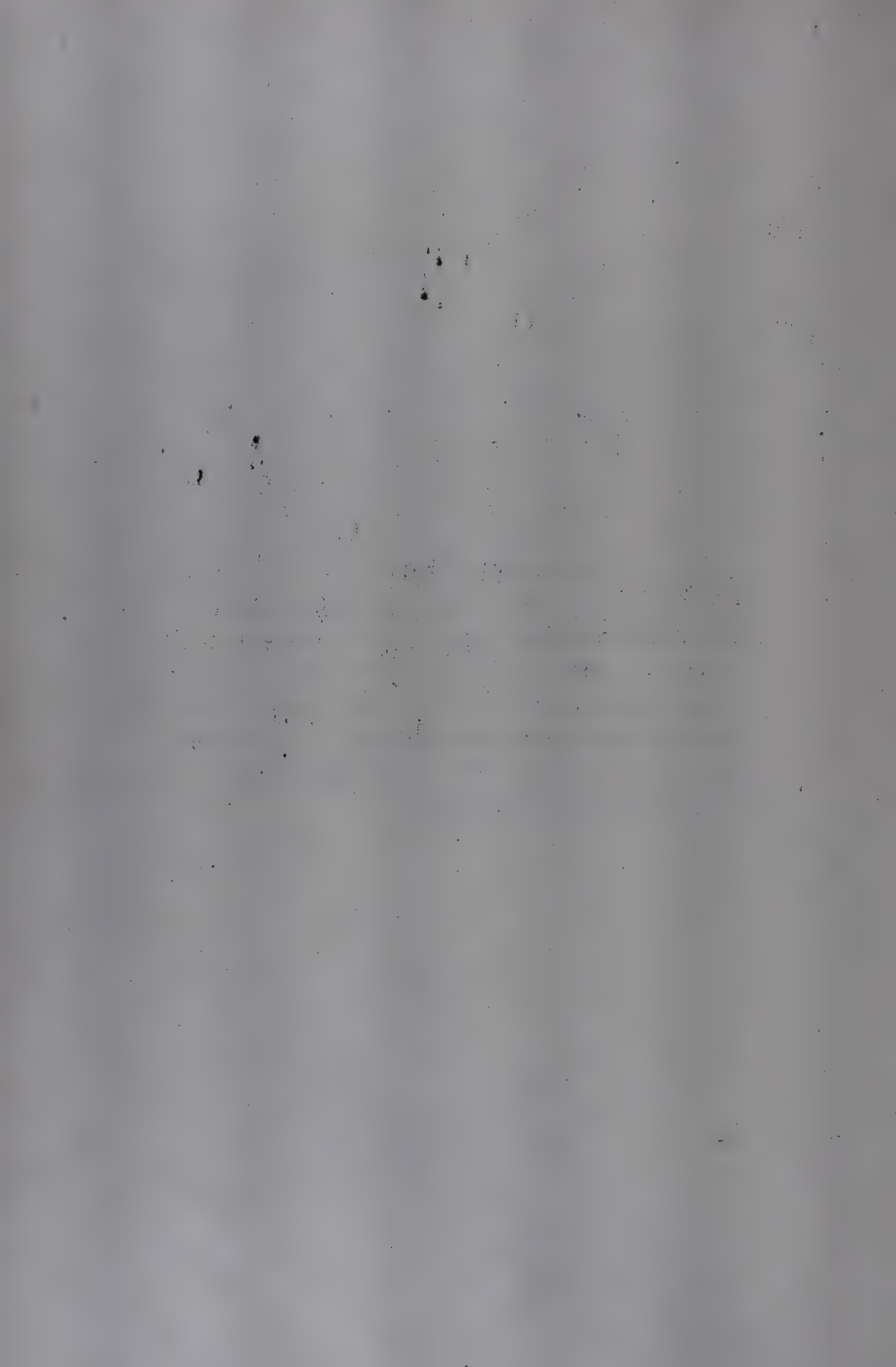
Winding up the discussions the Secretary (Industries) pointed out that the Research and Development needs of the Industries in the State could be met by a Central Research and Development Institute. It has to be examined as to what were the actual needs of Research and Development



of the Industry, how to bring about coordination amongst research work already being done by various agencies like the Universities, Private Industrialists, and the Industrial Testing and Research Laboratory of the State. It was pointed out that the results achieved in the Industrial Testing and Research Laboratory, Trivandrum could not be fully exploited for industrial purposes for want of necessary facilities both financial and otherwise for setting up pilot plants, design and Engineering facilities, etc. Unless the C.S.I.R. comes in a big way to support this venture, the task could not be accomplished. Whether the present Industrial Testing and Research Laboratory should be upgraded or a separate Regional Laboratory should be set up by the CSIR has to be further examined. There is a case for the CSIR coming in a big way for establishing a Regional Laboratory especially for doing Research in connection with the Cashew Oil, Lemon-grass oil, Titanium, Rubber, Ceramics, Glass, etc. Shri Baldev Singh was requested to give his reactions to the various suggestions discussed in the conference. Shri Baldev Singh then summarised the discussions and made the following suggestions:

- 1) A good case had been made for setting up a mechanical engineering centre;
- II) There was a communication gap for which an information network under the Secretary, (Industries) would be useful. This information Centre could be set up jointly by the industry, the CSIR and the State Government.

III) The question whether a Regional Laboratory of the CSIR complex should be set up should be discussed further by a larger group of industrialists. If possible a Conference of industrialists should be invited for a day which should be attended, if possible, by the Director General, CSIR who could then form a firsthand opinion as to what is the best way. The industrialists could also have across the table discussions with the DGSIR and other Directors from the laboratories. This could be done some time in August. Later the DGCSIR and if possible Shri C. Subramaniam could have a further discussion with the Chief Minister and other people to consider the manner in which the CSIR could be of assistance to Kerala State.



APPENDIX VI

A proposal to set up a R & D Laboratory
in Madhya Pradesh

APPENDIX VIA proposal to set up a R & D Laboratory
in Madhya PradeshBackground

The Government of Madhya Pradesh have been in correspondence with the Regional Research Laboratory, Hyderabad regarding a proposal to set up a research and development laboratory in Madhya Pradesh. Shri A.C. Shevade, Development Officer, Directorate of Industries, Madhya Pradesh, Bhopal was in Hyderabad during December 15-17, 1970 and held several discussions with the Director and other senior scientists of RRLH. He was also taken round the major pilot plants and some research divisions.

Suggested aims and objects of
the proposed laboratory

1. To carry out research and developmental work with a view to
 - a) explore possibilities of exploiting naturally occurring raw materials in Madhya Pradesh;
 - b) design and engineer projects on behalf of the Government, other research organisations and industry;
 - c) assist the existing industries in their expansion/diversification programmes; and
 - d) plan and draw up programmes for setting up new industries.

2. To provide facilities to the Government departments, technocrats and industry for pilot plant experimentation.
3. To assist the Government in the preparation of development plans.
4. To provide technical consultancy service to the industry and the Government.
5. To provide routine analytical and testing facilities to the Government and the industry.
6. To train technical personnel to man the specialised fields of industry.

General set up

The laboratory will have appropriate research groups to carry out laboratory and bench scale work on the chosen projects, a well-planned process evaluation, design and engineering division and a specially designed area for development of intermediate technology. In addition, infrastructure will consist of well-equipped analytical and testing laboratory having facilities for modern spectroscopic and chromatographic techniques, a workshop including a small foundry, library, documentatin and patent search facilities, economics, market survey, cost accountancy, technical forecasting and operational research and general administration.

Process evaluation, design and engineering

This will be the most important activity of the proposed laboratory designed to fill the major gap in the transfer of technology in India. To begin with,

the new laboratory could take up projects of relevance to Madhya Pradesh which have been completed on laboratory/pilot plant scale in other laboratories, and evaluate and engineer these for commercial exploitation.

Development of intermediate technology

Another interesting and useful activity much needed in India is the development of intermediate technology. Under this programme, the laboratory will set up facilities for intermediate scale working and these will be made available to technocrats and new entrepreneurs on nominal charges to upscale laboratory data and thus have experience at first hand of semi-commercial production. Projects finalised here can then easily be commercialised.

Proposed areas of work

Process evaluation, design and engineering

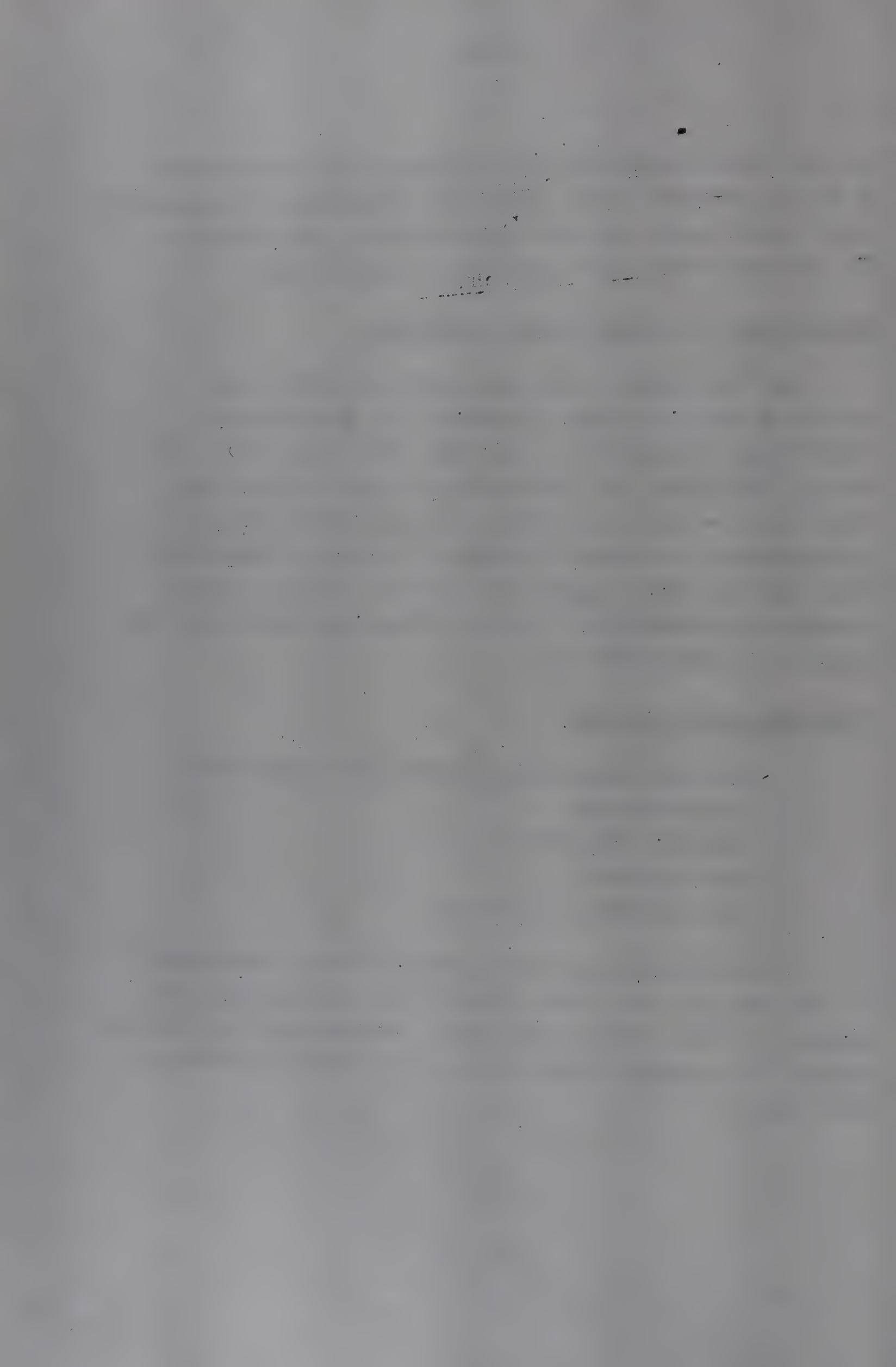
Agrochemicals

Mineral utilisation

Refractories

Intermediate technology

The proposed laboratory should have a character of its own and not a mere copy of any existing set up. Again, it will be advantageous to concentrate on a limited number of projects rather than cover a too wide field of activity.



Manpower requirementsR & D

Director	..	1
Deputy Director	..	1
Assistant Directors	..	7*
Senior Scientific Officers I	..	14
Senior Scientific Officers II	..	14
Senior Scientific/ Mechanical Assistants..		80
Laboratory Assistants/ Mechanics	..	40
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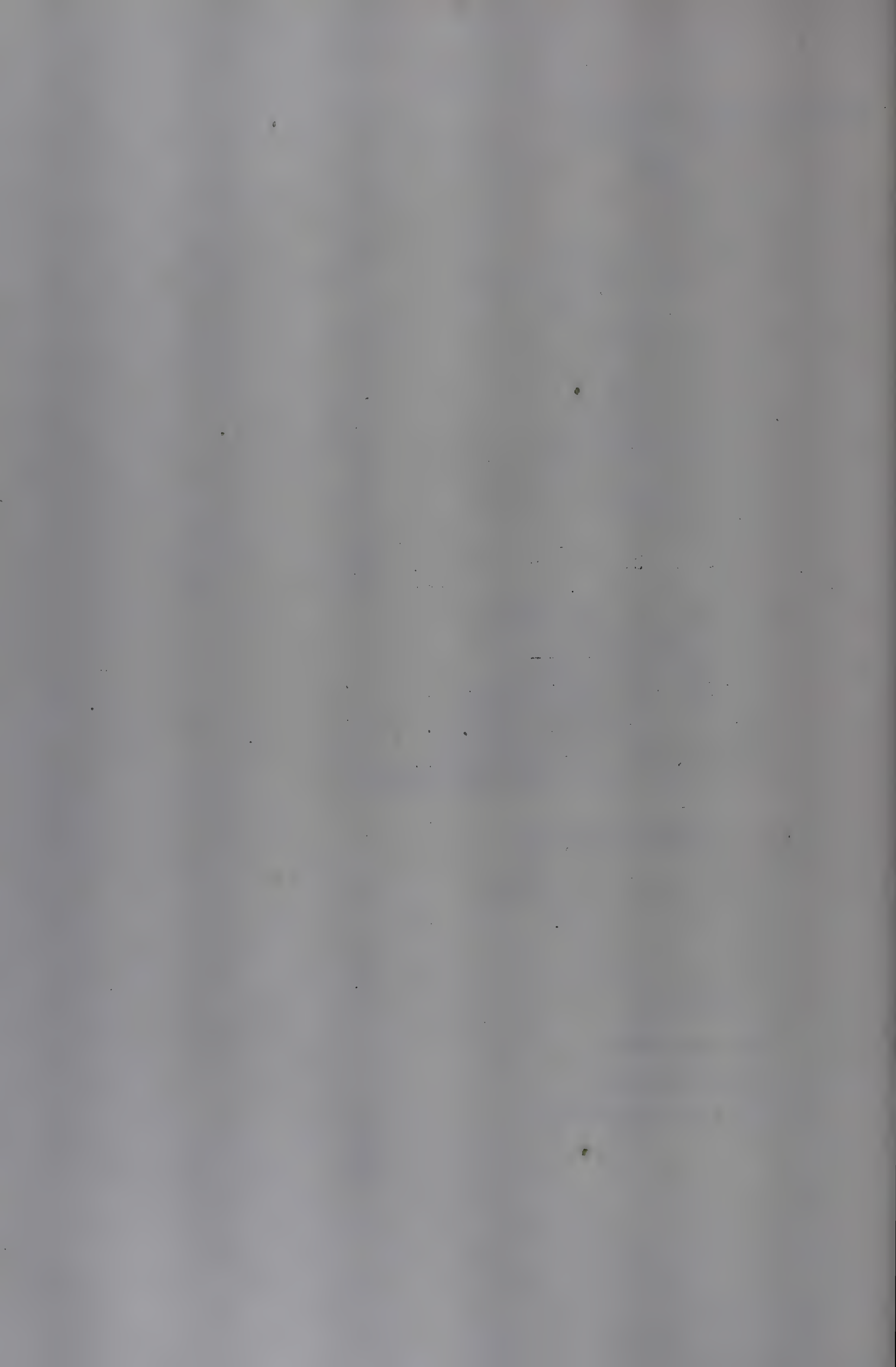
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- * 1. Mineral Utilisation
 2. Refractories
 3. Agrochemicals
 4. Chemical Engineering
 5. Process Evaluation and Design
 6. General Engineering
 7. Planning, Coordination, Liaison
 and Technical Information

Administration

Administrative Officer	..	1
Accounts Officer	..	1
Cost Accountant	..	1
Stores & Purchase Officer	..	1
Section Officers	..	2
Stenographers	..	12
Office Assistants	..	6
		<hr/>
		24
		<hr/>

24



House Keeping

Watch & Ward Officer	..	1	
Senior Laboratory Supervisor	..	1	
Civil Engineering Overseer	..	1	
Watchmen	..	16	
Laboratory Bearers/ Attendants	..	16	
Sweepers	..	12	
Peons/Messengers	..	6	
		<u>53</u>	53

Garden

Overseer	..	1	
Malis	..	12	
		<u>13</u>	13

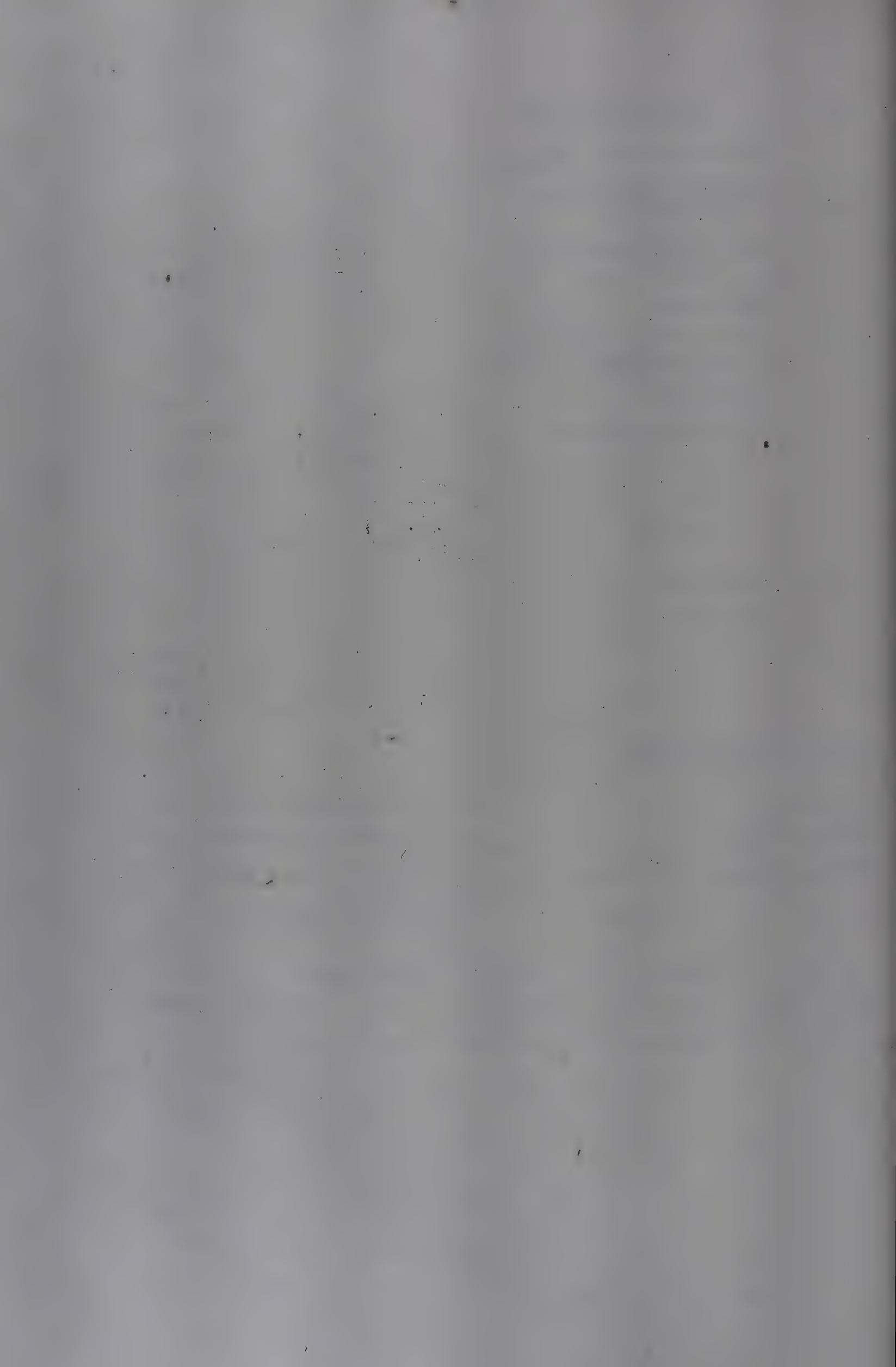
Total 247

Salary expenditure

R & D	Rs. 91,000 per month
Administration	Rs. 13,000 per month
House Keeping & Garden	Rs. 18,000 per month
Total	<u>Rs. 1,22,000 per month</u>

or Rs. 1.22 lakhs x 12 = Rs. 14.64 lakhs/year

Add 20% on account of benefits	..	Rs. 2.93 lakhs
Add 10% on account of unforeseen	..	Rs. 1.47 lakhs
Total	..	<u>Rs. 19.04 lakhs</u>



Total revenue expenditure

Salary expenditure is usually 60-70% of the total revenue expenditure. The total annual revenue expenditure will thus be about Rs.30 lakhs.

Phasing of revenue expenditure

Year	Rs. Lakhs		
	Salary	Other	Total
First	2.5	2.0	4.5
Second	6.0	3.0	9.5
Third	15.0	7.5	22.5
Fourth	18.0	10.5	28.0
Fifth	19.0	11.0	30.0

Initial staff recruitment

To begin with Director/Deputy Director, Administrative Officer, Stores Officer, Purchase Officer and Assistant Directors in General Engineering, Chemical Engineering and Planning and Coordination together with minimum supporting secretarial staff should be appointed. At the end of the first year, it should be possible to start construction work when it will be time to assemble the research team and also recruit other Assistant Directors. This recruitment will be completed in the third year to an extent of about 75% and fully completed in the 4th year.

Capital expenditure

Land: Though immediate requirements of land are not large, it is suggested that 100-150 acres of land may be acquired permitting future development of both laboratory/pilot plants and residential quarters.

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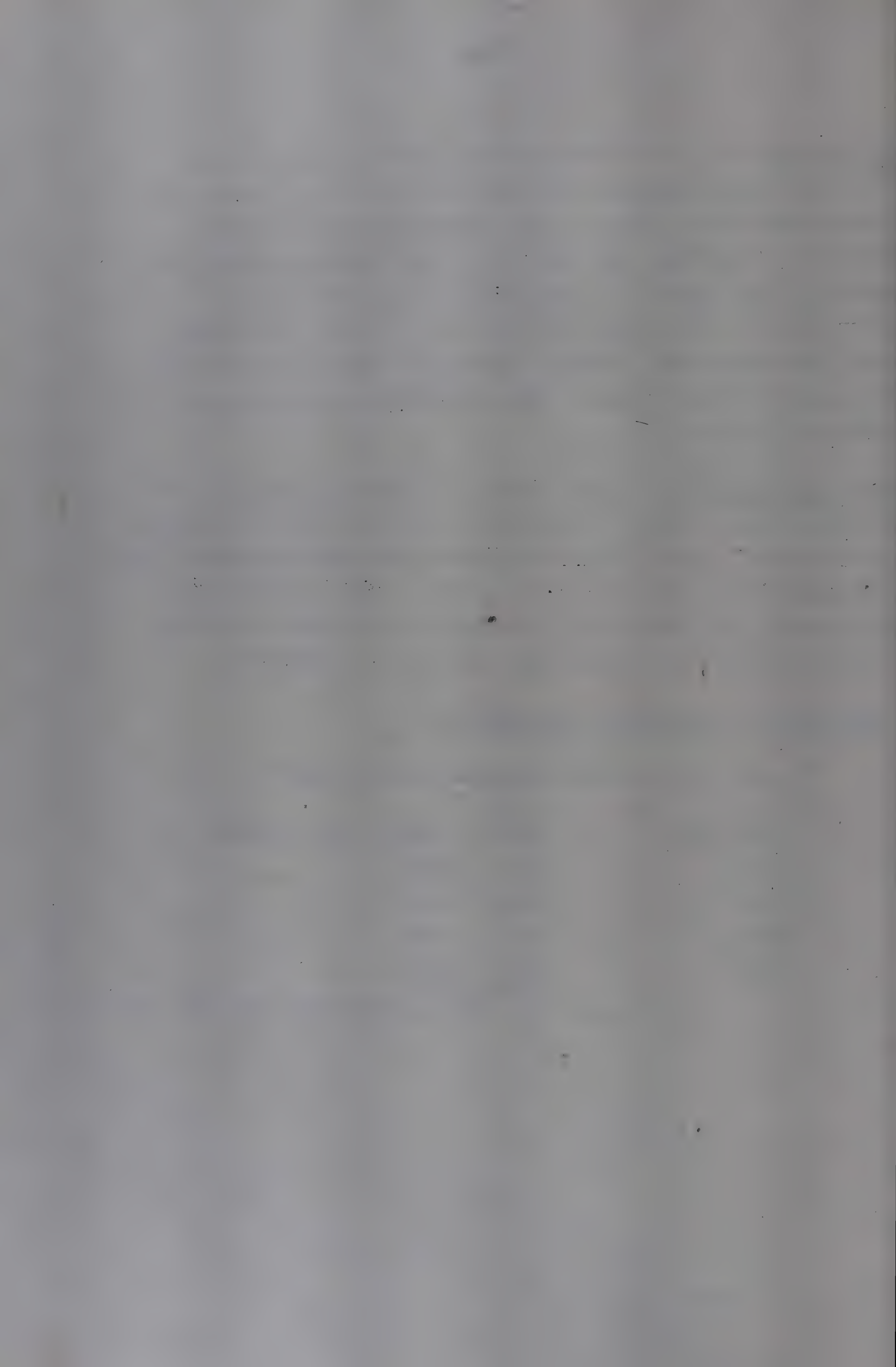
Buildings: It is estimated that about 40,000 sqr.ft. built-in space will be required to house the laboratory, administration, stores, etc. Complete ready-to-use building including all furniture and fittings will cost about Rs .35 lakhs. In addition, Rs.10 lakhs may be provided for buildings to house pilot plant, workshop and service units. Thus, a total of Rs.45 lakhs will be required for buildings. The estimate includes laying of internal roads.

Capital equipment: The nature of capital equipment will largely depend upon the projects selected by the proposed laboratory. Apart from the general equipment, specialised equipment will have to be procured. At a conservative estimate, Rs.1 crore will be required to equip a modern laboratory of the visualised size and assignment.

Phasing out of capital expenditure:

Total: Rs.1.45 crores plus cost of land

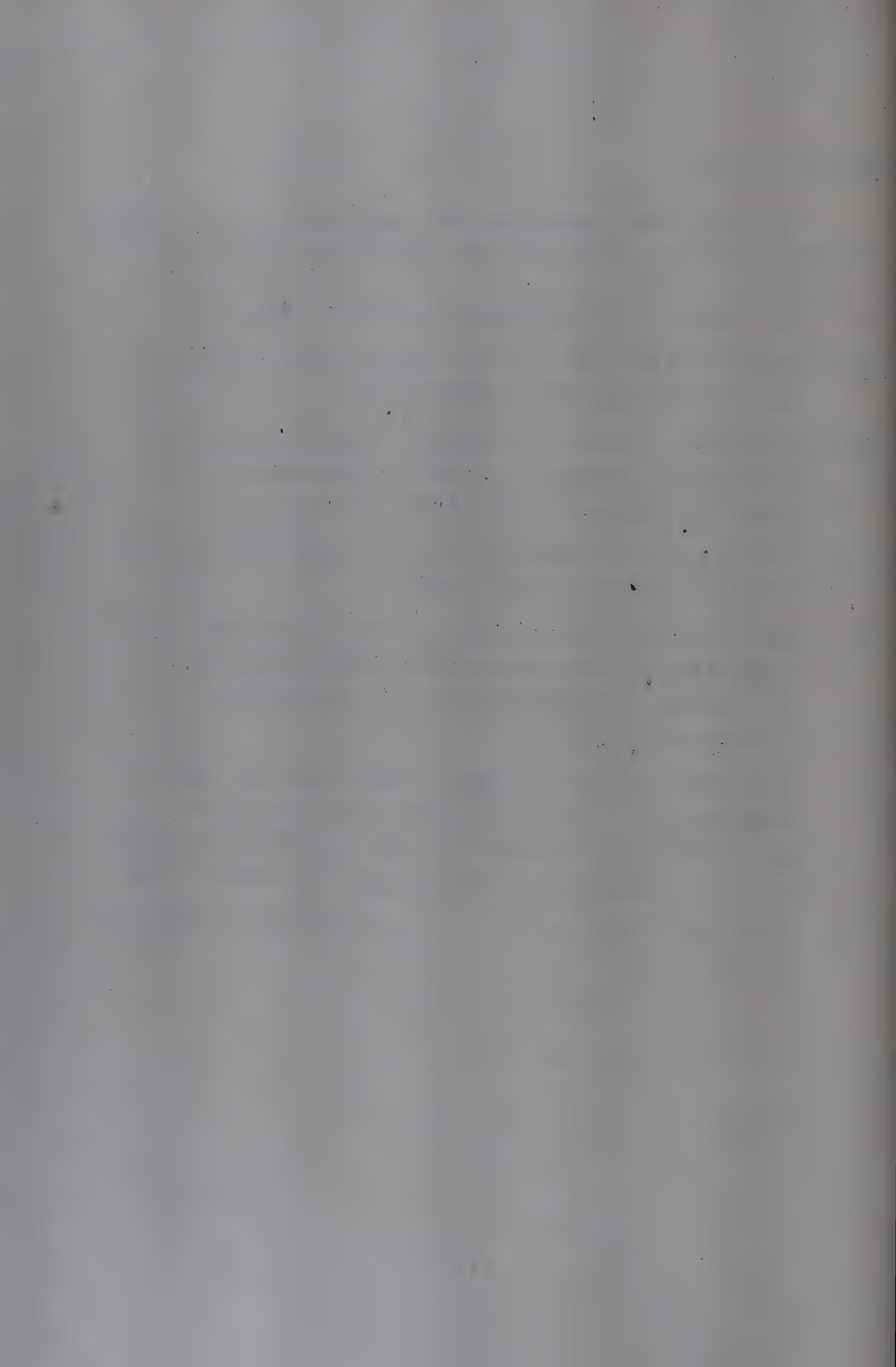
First year	Cost of land + Rs. 5 lakhs
Second	Rs. 45 lakhs
Third	Rs. 60 lakhs
Fourth	Rs. 30 lakhs
Fifth	Rs. 5 lakhs
Total	<u>Rs. 1.45 crores plus cost of land</u>



Site selection

The following considerations should be borne in mind during selection of site for the proposed laboratory:

1. Availability of sufficient land for expansion
2. Accessability by road and rail; location near an airport even more advantageous
3. Nearness to a city for facilities of purchases like minor chemicals, workshop materials and for hotel accommodation for guests and visitors
4. Availability of facilities like water, electricity and if possible sewage system
5. Proximity to a university and other research organisations for availing existing facilities of library, etc. and for mutual intellectual interaction
6. Provision of basic needs of employees like retail shopping, post office, banking facilities and recreation; if located far from existing facilities, extra investment will be required to provide these
7. Nearness to an existing or a potentially industrial area



APPENDIX VII

WORKING PAPER ON THE
SCOPE, ROLE, GOALS, AND FUTURE DEVELOPMENT OF THE
CSIR COMPLEX AT MADRAS



APPENDIX VIIWORKING PAPER ON THE
SCOPE, ROLE, GOALS, AND FUTURE DEVELOPMENT OF THE
CSIR COMPLEX AT MADRAS

by

PROF. G.S. RAMASWAMY, DIRECTOR, SERC AND
COORDINATING DIRECTOR, CSIR MADRAS COMPLEXMADRAS-20

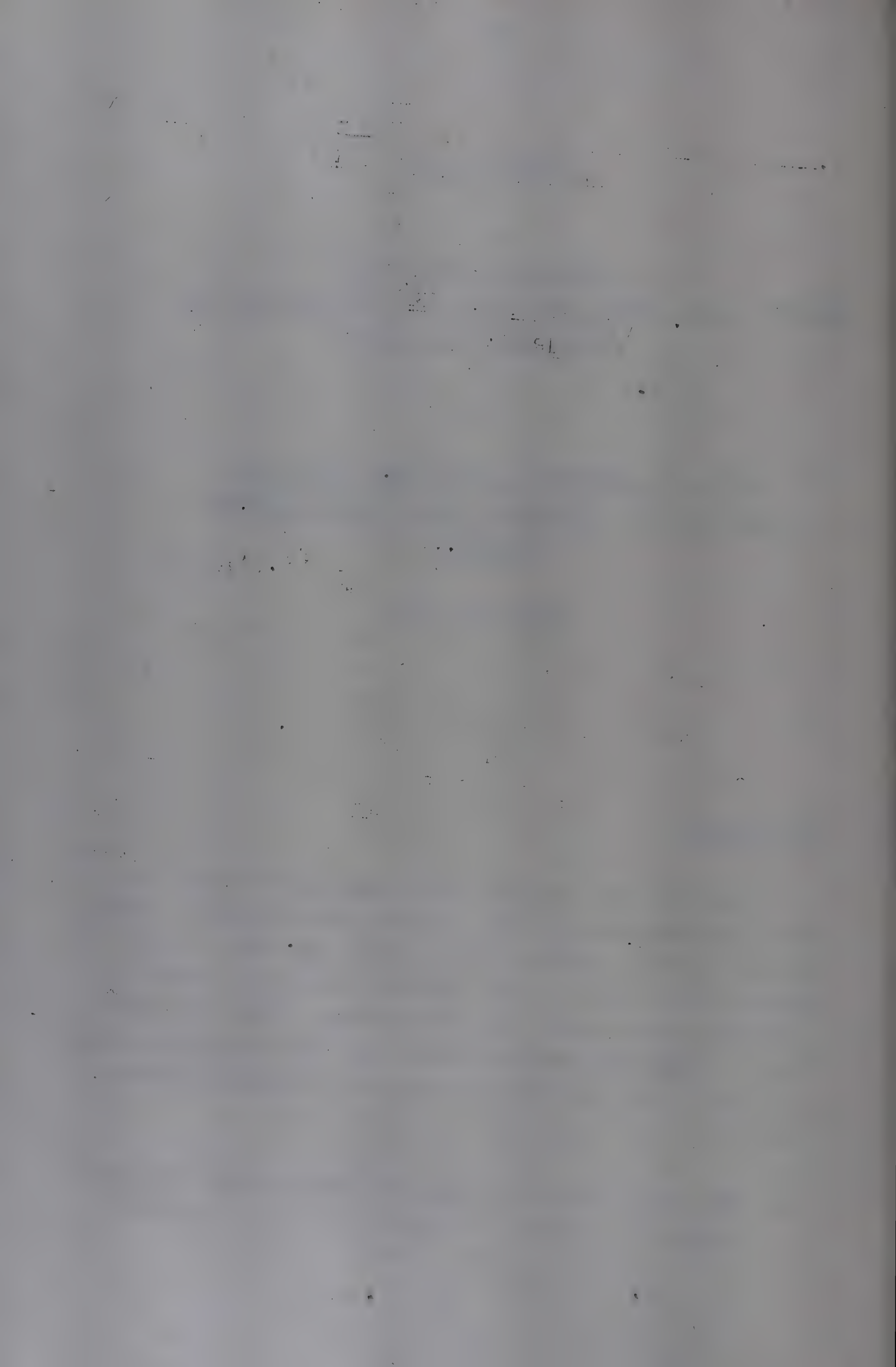
11TH JUNE 1973

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BACKGROUND

The setting up of the CSIR Complex at Madras to house regional units of six national laboratories - SERC, MERADO (CMERI), CECRI, CPHERI, NML, and CSIO - is an effort on the part of the CSIR to carry the results of research to the door step of the user. For the first time, a wide spectrum of skills has been assembled under one roof. The obvious advantages of this arrangement are:

- (i) The availability of several skills under one roof makes it possible to undertake inter- and multi-



laboratory research and development projects.

- ii) The problems referred by industry often call for a multi-disciplinary attack. This is possible by making adhoc consortia of the talent and facilities that will be available on the campus.
- iii) Division of labour is possible, each unit assuming the responsibility for providing services in its own line of specialisation to the others. Thus, SERC planned, designed and supervised all the civil works on the campus. It will provide computational facilities to all. MERADO will organize and manage the workshop facilities. The CSIO unit not only maintains and repairs all the instruments but also provides assistance to the other laboratories in designing and fabricating special instruments. CPHERI is in charge of water supply, sewage disposal and treatment of industrial effluents.
- iv) Several services such as administrative, accounts, stores & purchase, transport, workshop and computational facilities can be shared to reduce overheads.

The construction of the first phase of the campus is now nearly over and four of the units, viz., SERC, MERADO, CSIO, and CECRI, are already housed on it. The CPHERI buildings are nearing completion and this unit is expected to move in September 1973. The buildings for housing the NML regional centre are now ready and the present indications

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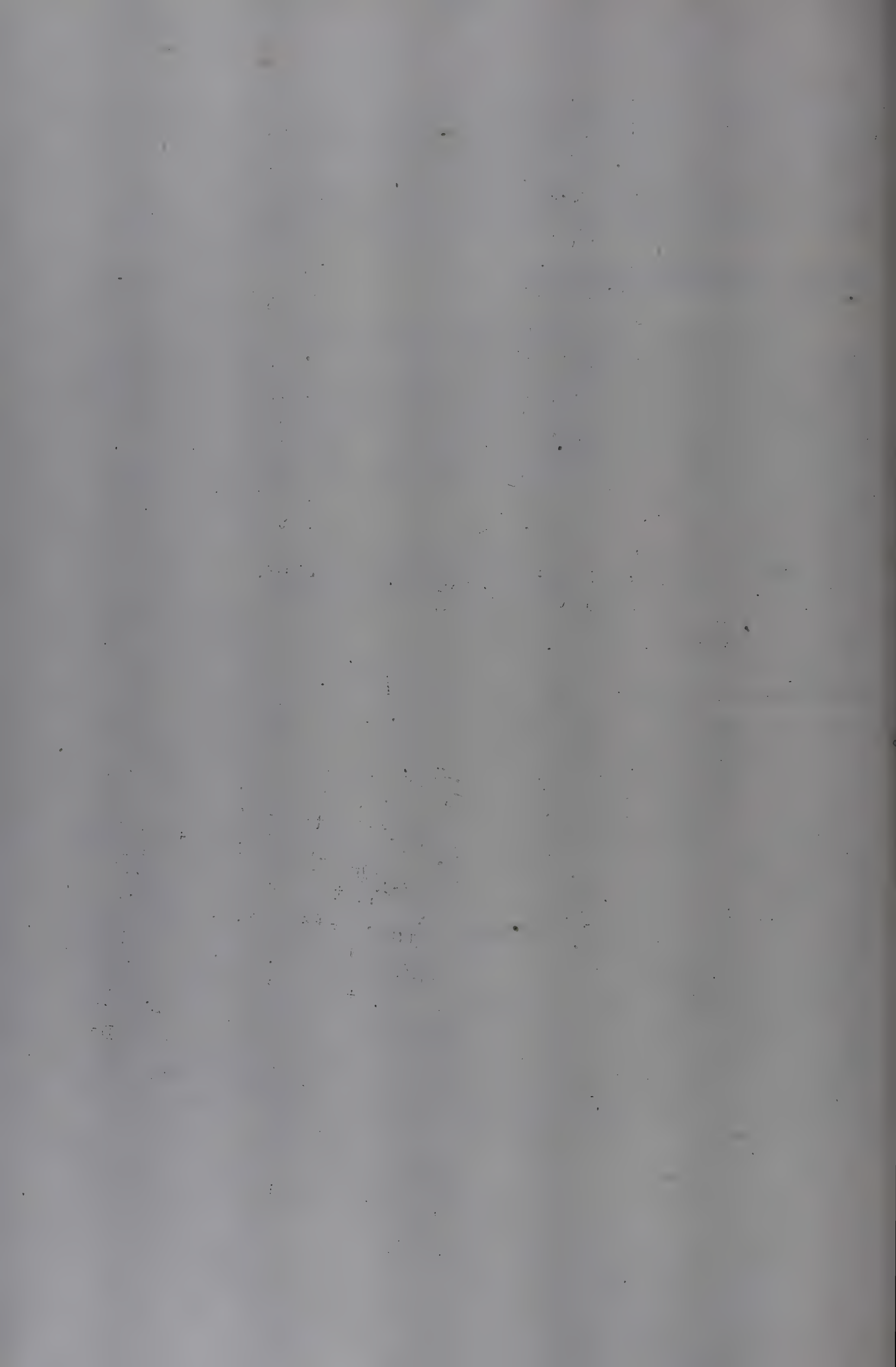
are that this unit will start functioning as a full-fledged unit from the campus by December 1973. The time is therefore opportune to do some clear thinking about the scope, role, goals, and future development of the Complex.

REVIEW OF PRESENT WORKING

At present, the units are functioning independently, there being very little inter-laboratory or multi-laboratory activity. They, no doubt, help each other, but there is no active interaction worth mentioning. The main factors responsible for this passive attitude are identified and discussed below:

(a) Differing functions and divergent goals

At one end of the spectrum, we have the SER(R)C which is engaged in both research and development, and has a complement of experienced and senior staff headed by the Director himself. The Regional Centre is visualized as a second campus which handles certain types of projects for which Madras, because of its location in the heart of a highly industrialized belt, is more suitable than Roorkee. On the other end of the spectrum, there is the CSIO unit described as a Service & Maintenance Centre. This label may well be a misnomer. MERADO, headed by a Deputy Director, is somewhere in between and is engaged in providing certain specialized services to industry. It also undertakes design and development but does not carry out any research. In the CECRI, the accent is on demonstration units set up on the basis of processes developed at the parent laboratory.

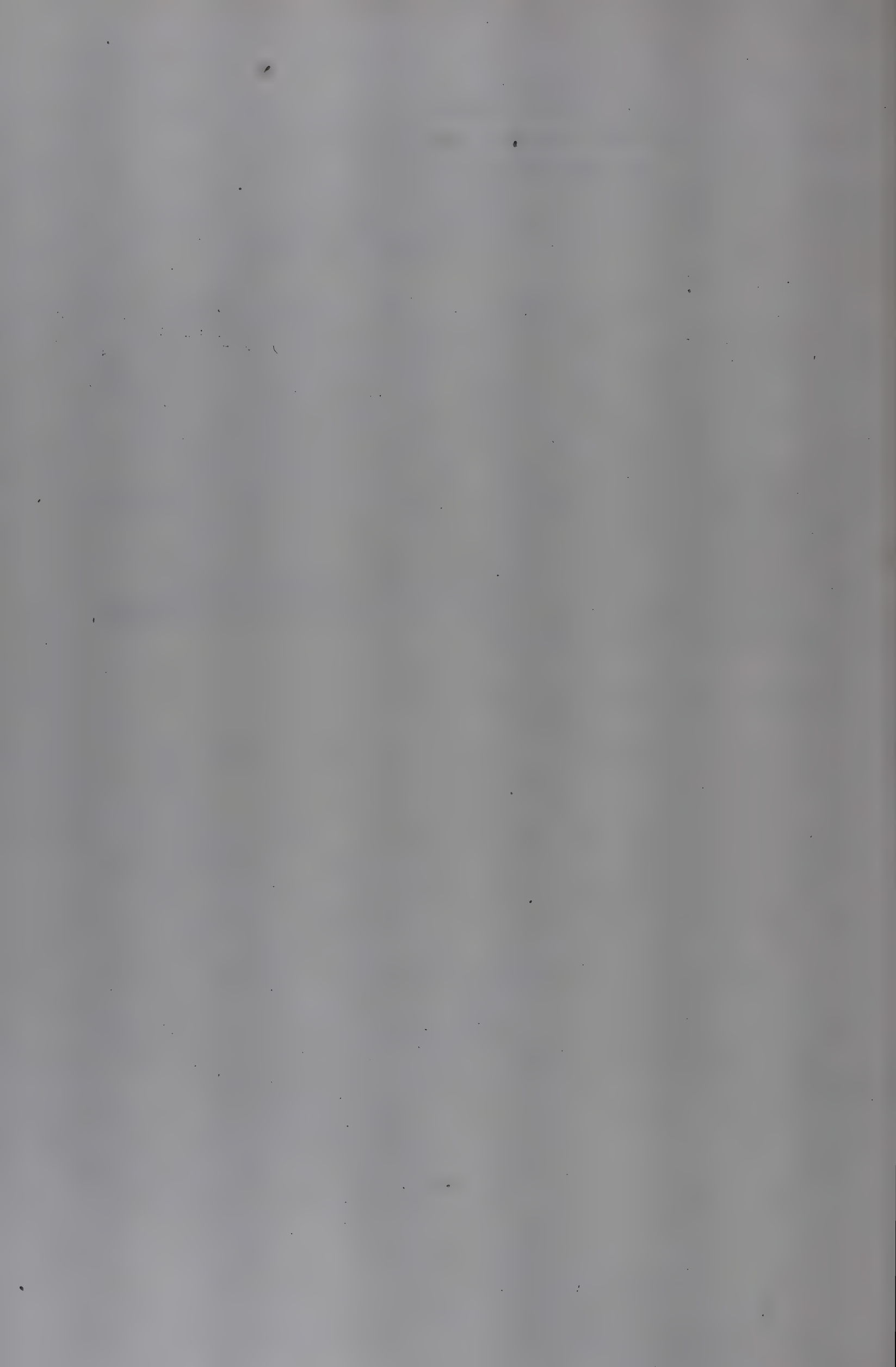


The CIPHERI unit is mainly engaged in undertaking field studies and providing counselling services to other organizations. The NML Foundry Station confines its activities at present to providing technical assistance and testing facilities to the foundry industry.

Limiting the activities of some of the regional units merely to service, maintenance, or extension may discourage talented and experienced staff from accepting postings to the Madras Complex. It will also stunt the growth and creative potentialities of the scientists so posted and will, in the long run, breed frustration. Whatever may be the historical reasons for these differing functions and divergent goals, the time is ripe for re-examining them. Collaboration can sprout and grow only among a like-minded community of scientists actuated by some common goals and aims.

(b) Uneven staffing pattern

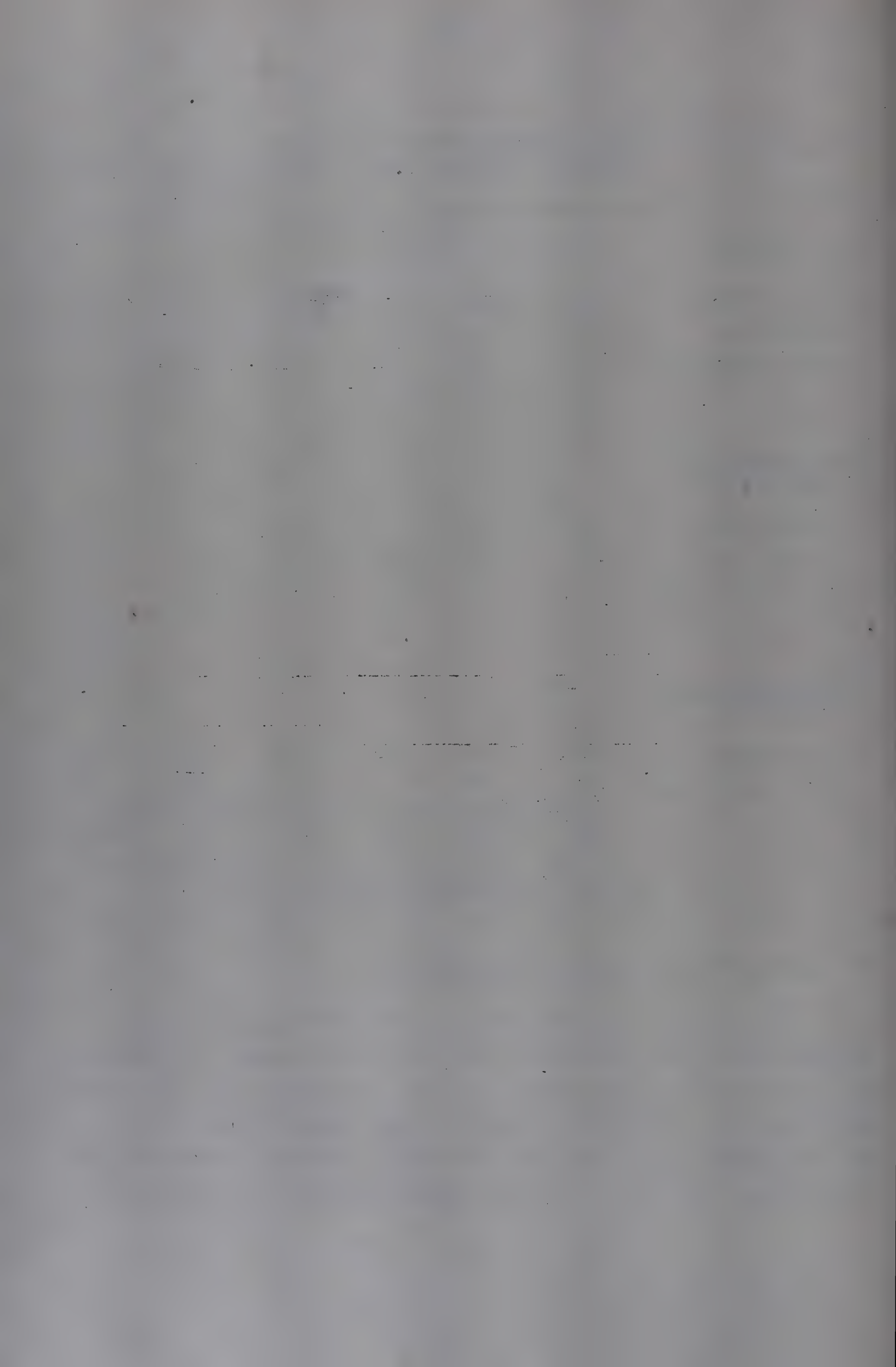
Some of the units are headed by Deputy Directors and have a fairly adequate complement of staff. Some with ambitious plans do not at present appear to have enough staff either in terms of experience or in numbers to match the tasks that they propose to undertake. The table below summarizes the current staffing position of the units and the common services. In handling projects offered by industry which often call for multi-disciplinary effort, the strength of the chain will always be decided by its weakest link. Unless we have more or less even strength, we cannot keep our promises to industry.



Category	SER(R)C	MERADO	CSIO	CECRI	COMMON SERVICES	TOTAL
<u>1. Gazetted:</u>						
Scientific	30	8	5	5	-	48
Technical	1	-	-	-	3	4
Non-technical	-	-	-	-	4	4
						<u>56</u>
<u>2. Non-gazetted:</u>						
<u>Class III</u>						
Scientific	8	1	2	2	-	11
Technical	27	21	20	4	14	86
Non-technical	6	2	2	1	28	39
						<u>136</u>
<u>3. Non-gazetted:</u>						
<u>Class IV</u>						
Technical	10	6	2	3	5	26
Non-technical	2	1	-	-	32	35
	<u>84</u>	<u>39</u>	<u>29</u>	<u>15</u>	<u>86</u>	<u>61</u>
<u>Total of categories 1+2+3 = 253</u>						

(c) Limited role of the Coordinator

The limited mandate given to the Coordinator by his brother Directors restricts his role, at present, to planning of civil works on the campus and the management of the common services. It is now for the participating Directors to decide whether his functions should be widened to enable him to develop the complex as an integrated unit. If this be



the intention, he has to act as the link between the complex and industry and other outside agencies. To play such a role effectively, he will need the willing consent of the participating Directors to coordinate inter-laboratory and multi-laboratory activities.

(d) Lack of Information, Industrial Liaison, Publication, Publicity, and Public Relations Infrastructure

The Complex at present has no Information, Industrial Liaison, Publications, Publicity, and Public Relations infrastructure. The need for such supporting services for establishing close and continuing rapport with industry became acutely evident when all the units worked together in carrying out an industrial survey of Tamil Nadu and Pondicherry States at the suggestion of Dr. Nayudamma. One of the officers with a flair for this type of work was very kindly loaned from the CECRI unit temporarily for assisting the scientists in this task. The infrastructure proposed for meeting the immediate and anticipated needs of the Complex during the next five years is given below. The anticipated needs are extracted from the Fifth Five Year Plan for the development of the Complex, copies of which have been tabled for the information and approval by the participating Directors. These proposals may be discussed and approved with such modifications as may be considered necessary.



Immediate needs

1. Scientist 'C' (Rs. 700-1250)	...	1 Post
2. Scientist 'B' (Rs. 400-950)	...	1 "
3. Senior Scientific Assistant (Rs. 325-575)	...	1 "
4. Junior Stenographer (Rs. 130-300)	...	1 "
5. Helper (Rs. 70-85)	...	1 "

Requirements at the end of the Fifth Five Year Plan

1. Scientist 'C' (Rs. 700-1250)	...	1 "
2. Scientist 'B' (Rs. 400-950)	...	2 Posts
3. Senior Scientific Assistant (Rs. 325-575)	...	2 "
4. Senior Artist (Rs. 325-575)	...	1 Post
5. Proof Reader (Rs. 210-425)	...	1 "
6. Photographer (Rs. 150-300)	...	1 "
7. Junior Stenographer (Rs. 130-300)	...	1 "
8. Lower Division Clerk (Rs. 110-180)	...	1 "
9. Dark Room Assistant (Rs. 110-155)	...	1 "
10. Copy Holder (Rs. 110-147)	...	1 "
11. Helper (Rs. 70-85)	...	2 Posts

I have already requested the Director General to immediately approve of the creation of a post of Scientist 'B' to accept the officer of the CECRI who assisted us in carrying out the Industrial Survey to prepare the ground for the CSIR-Industry Meet to be organized in the near future. This needs endorsement by the participating Directors.

LACK OF DETAILED INFORMATION ON THE FIVE YEAR PLANS OF THE REGIONAL UNITS

Another factor that is standing in the way of making any commitments to industry and accepting multi-disciplinary projects is the lack of complete information on the Five Year Plans of the Regional Units and the major activities that they propose to undertake during the plan period. The Coordinator is almost completely in the dark about the strength of the staff that will be stationed at Madras by the various units. This severely handicaps him in working out the supporting administrative, information and liaison, and stores and purchase infrastructure. Some of the heads of the units are themselves in the dark about the development plans of their units during the Fifth Plan period possibly because they are not intimately involved in the planning process. No information has so far been received from the participating Directors about their Five Year Plans for their Regional Units at Madras. Heads of the units stationed at Madras have furnished the information in their possession. But this is somewhat sketchy and incomplete. NML has now asked for 5 acres of land for locating a pilot plant on Ore Dressing. What supporting services that the Complex will be called upon to provide is not clear. The Coordinator will certainly appreciate detailed prior consultation whenever one of the participating units proposes

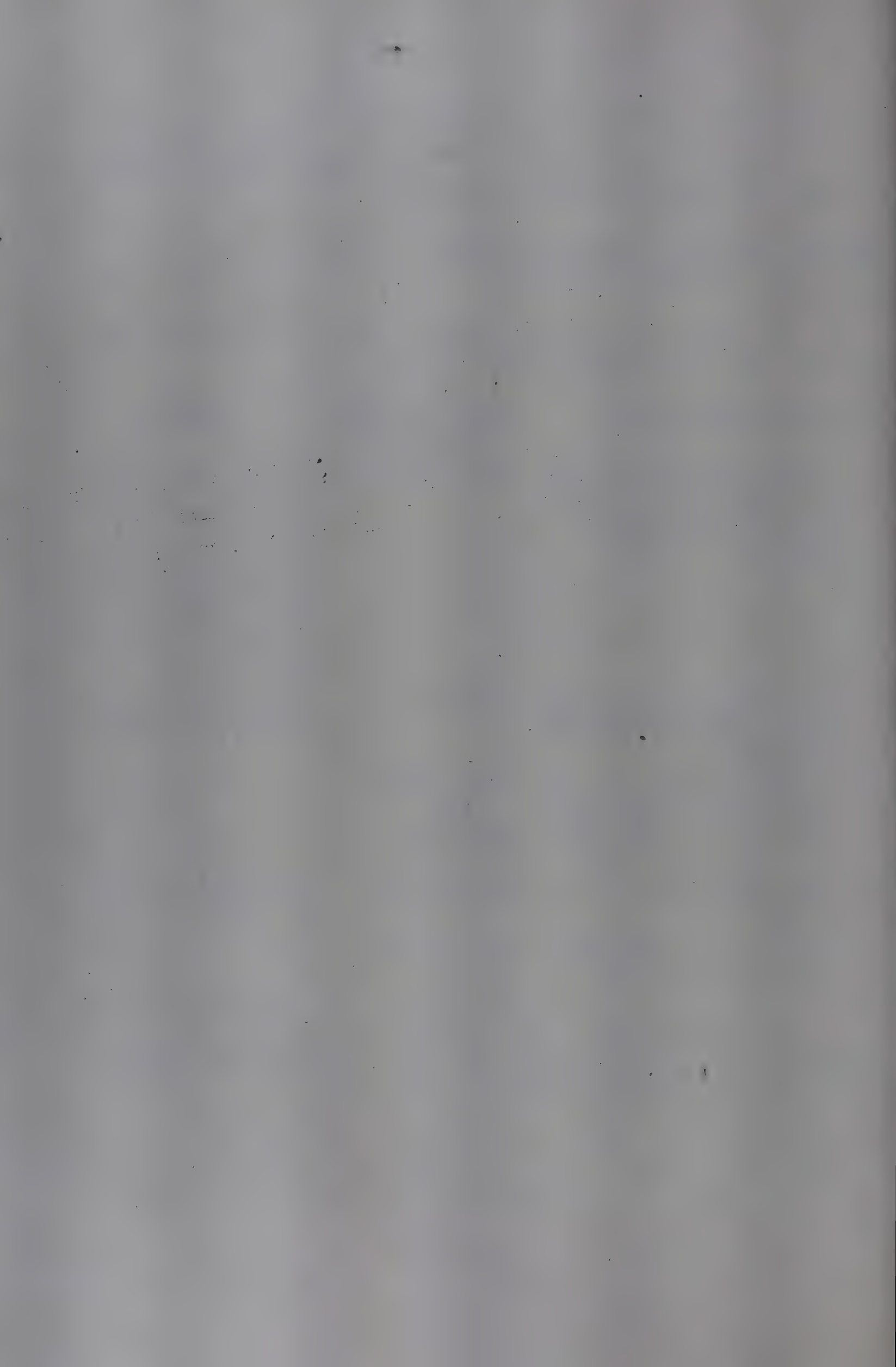
to undertake a major new activity on the campus. It will help him to plan and provide efficient supporting services to make the activity fully effective.

SUGGESTIONS FOR INTER-LABORATORY AND MULTI-LABORATORY PROJECTS

The heads of units stationed at Madras were consulted and the following suggestions have emerged:

<u>Title of the project</u>	<u>Collaborating partners</u>	<u>Remarks</u>
1. Design and development of construction machinery and precasting and prefabrication plants	SERC/MERADO	Consultants from industry will be drafted if found necessary. This project is being recommended by the NCST Group on Prefabrication and Industrialized Building
2. Development of designs for portable prestressing beds	SERC/MERADO	This project is already underway
3. Automatic analyzer for the biochemical analysis of blood and other physiological fluids	CSIO/MERADO and CENTRAL POLYTECHNIC	
4. Servo-Mechanism valve actuator	MERADO/CSIO	Problem referred by TANSI
5. Treatment of chemical and industrial wastes	CPHERI/CECRI	

The Coordinator would suggest the following additional projects for consideration. He has already had informal discussions with the scientists concerned:



<u>Title of the project</u>	<u>Collaborating partners</u>	<u>Remarks</u>
1. Use of solar energy for heating, air-conditioning, and refrigeration	CECRI/SERC/MERADO/CSIO	The object is to develop inexpensive solar water heaters, air-conditioning and refrigeration devices
2. Lateritic light-weight aggregates for concrete making	SERC/CECRI	Laterites occur in Tamil Nadu, Andhra Pradesh & Kerala

If the participating Directors approve of these projects, detailed project reports will be got prepared.

GUIDELINES FOR HANDLING MULTI-DISCIPLINARY PROJECTS OFFERED BY INDUSTRY

1. Inter-disciplinary projects from industry may be attracted to the Complex either at the initiative of the Coordinator or of the individual units.

2. The Coordinator may be brought into the picture as soon as any of the units make the initial contacts.

3. The Coordinator will convene a meeting of the heads of the units to discuss the project. As a result of the discussions, an inter-disciplinary team will be named with a Project Leader drawn from the major discipline involved.

4. The Project Leader will be responsible for the coordination and progress of the project. He will also be responsible for all trouble-shooting. Adequate powers will be delegated to him for the management of the project.

5. All decisions relating to inter-disciplinary projects will be taken locally by the Project Leader and the Coordinator, and the parent laboratories involved kept informed.

6. Where projects are fully financed by industry, the funds received will be credited under the Complex account and the expenditure on the project will be met therefrom. The expenditure will be sanctioned by the Project Leader/Coordinator.

7. After accounting for the cost of the project, the balance of the amount received from industry will be distributed between CSIR and investigators in accordance with rules. It is essential that such incentives are offered to scientists to give industrial orientation to the research and development activities of the Complex and to foster and promote multi-laboratory cooperation.

8. In the case of projects which are only partially financed by industry, CSIR's contribution will be provided for in the Complex budget. Such projects need to be anticipated at the time budget proposals are framed or in the revised estimates.

9. Each inter- or multi-laboratory project will be assisted by an Expert Committee consisting of the Project Leader, one or more members of the project team, and one or two recognized experts drawn from industry.

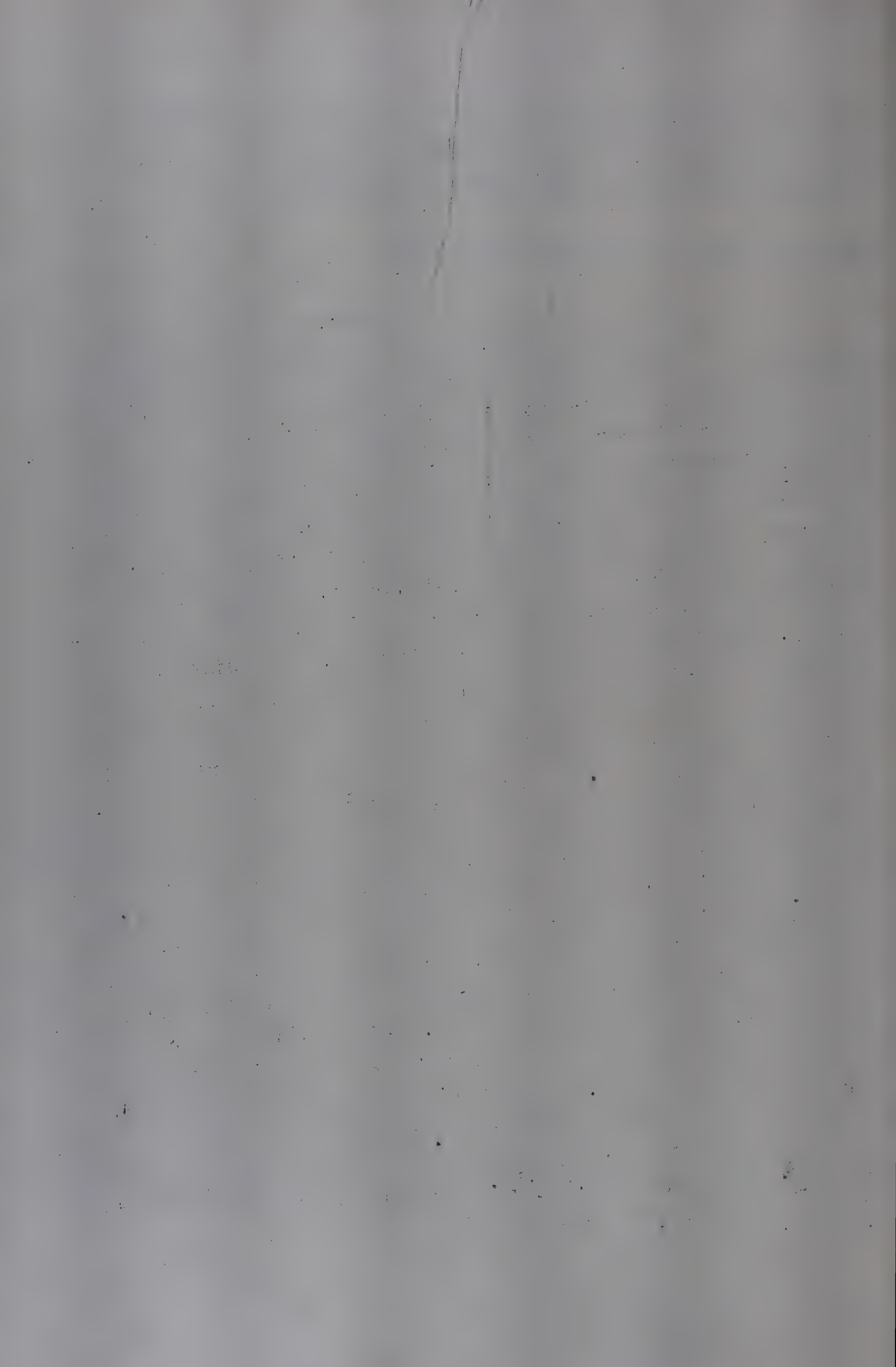
MANAGEMENT

The Complex offers an enviable opportunity to introduce an administrative system specially suited to research management. Such a system needs to be officer-oriented and this implies that the number of middle level staff such as assistants has to be increased and assigned functional responsibilities and the number of clerks reduced. This will also mean a more liberal provision of stenographic help to officers.

-It is also proposed that the pay bills may be prepared on the computer with the help of SERC's computer facilities. It is also proposed to computerize inventory-control.

EXECUTIVE AND COORDINATION COMMITTEES

In the present set up, the Coordinating Director is assisted by a Coordinating Committee consisting of himself as the Chairman, the Administrative Officer as the Secretary, the Accounts Officer as the Joint Secretary, and the heads of units as members. The budget for the Common Services of the Complex is framed in consultation with the Coordinating Committee and got approved by the Coordinating Director dealing with the Director General direct. In line with the reorganization of the Executive Councils of National Laboratories, it is suggested that the Complex, following the pattern of National Laboratories, may have an Executive Committee consisting of the Director General or the Coordinator as the Chairman and the Directors of the participating units as members. If the Director General is the Chairman, the Coordinating Director may be designated as the Vice Chairman. The Administrative Officer may be the Secretary of this Committee. The Executive Committee will be in addition to the existing Coordinating Committee which will continue with the following composition. The Coordinating Director will be the Chairman, heads of units and the Deputy Director of the SER(R)C will be the members. The Administrative Officer will be the Secretary and the Accounts Officer will be the Joint Secretary. But it will be of a consultative nature. The inter- and multi-laboratory projects and the budget relating to the Complex will be framed by the Coordinating Director in consultation with the Coordinating Committee. These recommendations will then be placed before the



Executive Committee for approval. The participating Directors may consider the desirability of having a few outside experts, one in each major discipline, being associated as members of the Executive Committee. The outside experts may preferably be drawn from among well-known figures in industry in the Southern Region. The Coordinating Committee will meet every month and the Executive Committee at least twice a year. In addition, each of the inter- and multi-disciplinary projects may have Expert Committees attached to them, as already mentioned.

NEW CIVIL WORKS

Provision has been made in the draft Five Year Plan proposals for the following civil works:

1. Library
2. Auditorium
3. Additional floor for main block
4. Trainees Hostel
5. Guest House
6. Quarters for essential staff
7. Roads, culverts, and storm water drainage
8. Extension of electric sub-station, automobile workshop, and other facilities
9. Compound wall and Guard rooms

The requirements of additional space by individual units are not included in these estimates as no details are available from the laboratories concerned. If these units have provided for such expansion in their Five Year Plans, these amounts need to be transferred to the Complex budget.

CONCLUSION

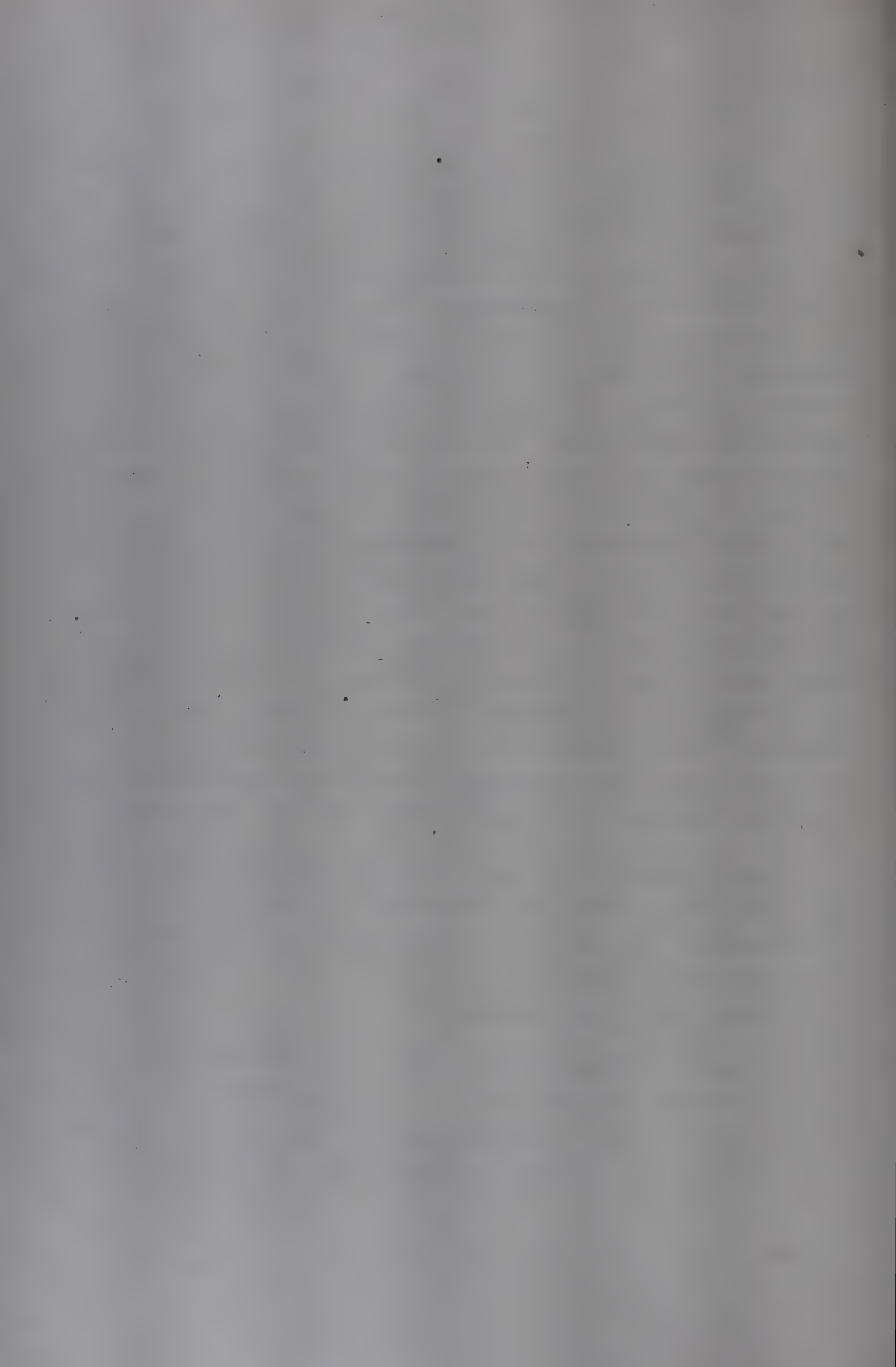
If the Complex is to function as originally visualized by the Governing Body as an effective link between Research and Industry with the units housed on the campus interacting actively with each other by participating in inter-disciplinary projects referred by industry in the region, it is necessary to restructure its working as outlined in this working paper. Industry will judge the performance of the Complex by the success or failure of the first few projects that we undertake. This means that in the beginning we have to be highly selective in the type of projects that we undertake keeping in mind the kind of staff and supporting facilities available. Moreover, it is extremely important that we keep the promises that we make to industry by way of results as well as time-targets. The chain can have no weak links. The multi-disciplinary facilities available on the campus also need to be made known to industry by adequate publicity activities. As a first step in this direction, an attractive brochure on the Complex is now under preparation. The Directors may glance through the draft of the brochure when they are here and offer suggestions for its improvement.

The following suggestions which are reproduced from the 'Report on Survey of Industries in Tamil Nadu and Pondicherry' also call for follow-up action to strengthen our links with industry:

"The CSIR Laboratories

should develop more contacts with industry through frequent two-way visits and get-togethers.

should take effective steps to see that their dealings with the industry are prompt and business-like.



should establish technical information centres or data banks to serve as sources of information on up-to-date developments in various fields of science and technology.

should organize mobile exhibitions of their processes and products.

should make available to industry the services of scientists on short-term assignments to work in the factories for solving ad hoc problems.

should simplify and streamline the procedures in order to make transfer of technology speedy and effective".

Participating Directors may like to add to this list so that we are able to project a better image of ourselves to industry.

APPENDIX VIII

CSIR MADRAS COMPLEX
Minutes of the Meeting

APPENDIX VIIICSIR MADRAS COMPLEX

Minutes of the meeting of the Directors and heads of the participating Units of the CSIR Madras Complex held under the chairmanship of Dr.Y.Nayudamma, DGSIR, on 15-6-1973 at 10.00 AM in the Conference Room of the CSIR Madras Complex, Madras-20.

PRESENT

Dr. Y.Nayudamma,
DGSIR.

Chairman

Prof. G.S.Ramaswamy,
Director, SERC.

Co-ordinating
Director

Dr. H.V.K. Udupa,
Director, CECRI, Karaikudi.

Dr. Harsh Vardhan,
Director, CSIO, Chandigarh.

Dr. N.Majumdar,
Director, CPHERI, Nagpur.

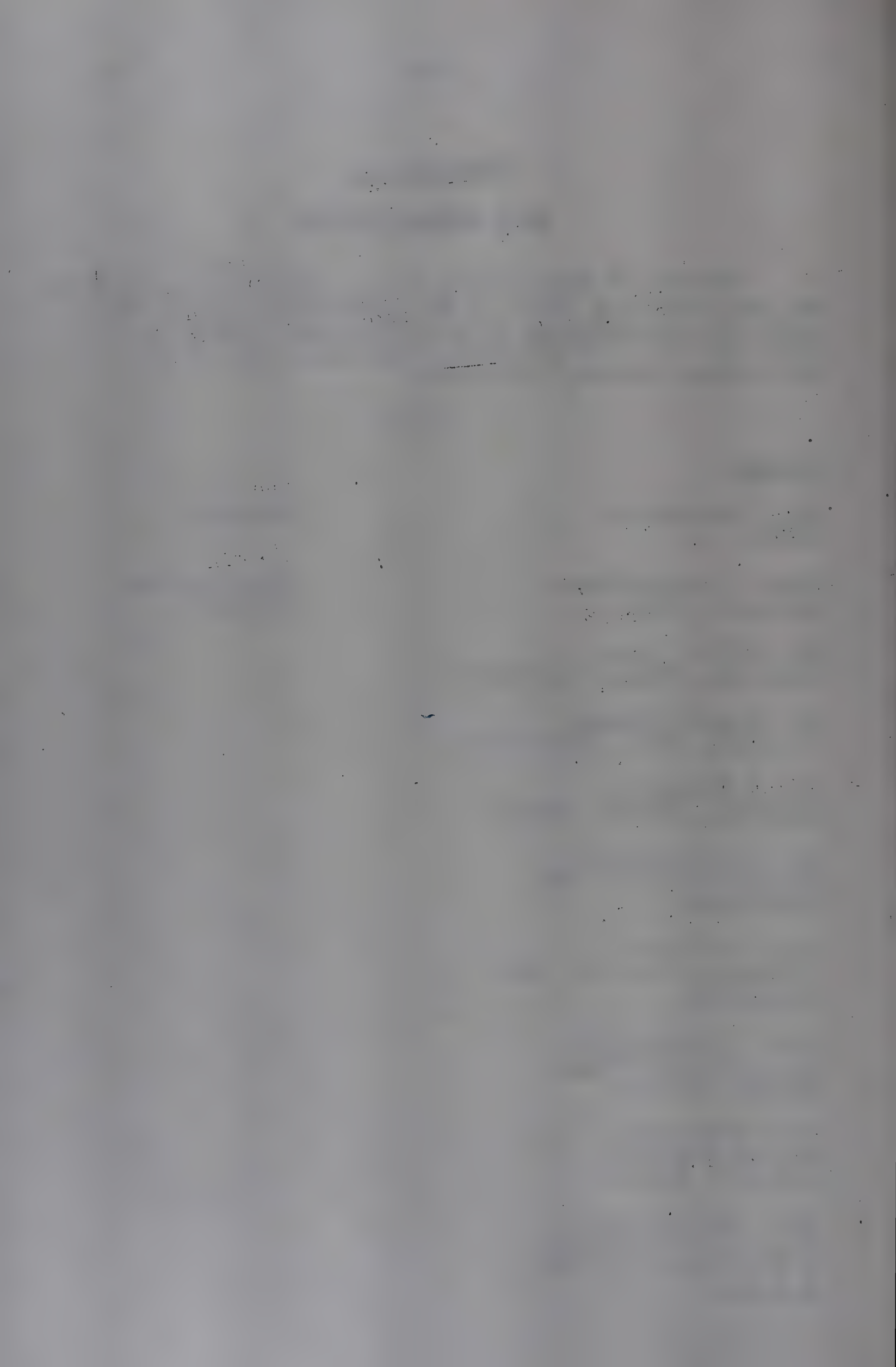
Dr. A.B.Chatterjee,
Deputy Director, NML,
Jamshedpur.

Shri Y.N.Trehan,
Assistant Director, NML,
Jamshedpur.

Shri A.Chakravarty,
Scientist-in-Charge,
MERADO, Madras.

Shri M.Ramaiah,
Deputy Director,
SER(R)C, Madras.

Shri U.H.Narayanan,
Scientist-in-Charge,
S & M Centre of CSIO,
Madras.



Shri N.V. Naidu,
Field Officer, NML Foundry
Station, Madras.

Dr. M.Vittal Rao,
Scientist-in-Charge,
CPHERI Zonal Centre, Madras.

Dr. N.V. Parthasarathy,
Scientist-in-Charge,
CECRI Madras Unit, Madras.

Dr. N. Ramanathan,
Scientist-in-Charge, CLRI,
Madras.

Special Invitee

Shri M.P. Sood,
Assistant Director,
S & M Centre of CSIO, Madras.

"

Shri N. Balasubramanian,
Officer-in-Charge, Library,
CSIR Madras Complex, Madras.

"

Shri Kishan Lal,
Administrative Officer,
CSIR Madras Complex, Madras.

"

Shri R.S. Nayar,
Accounts Officer,
CSIR Madras Complex, Madras.

"

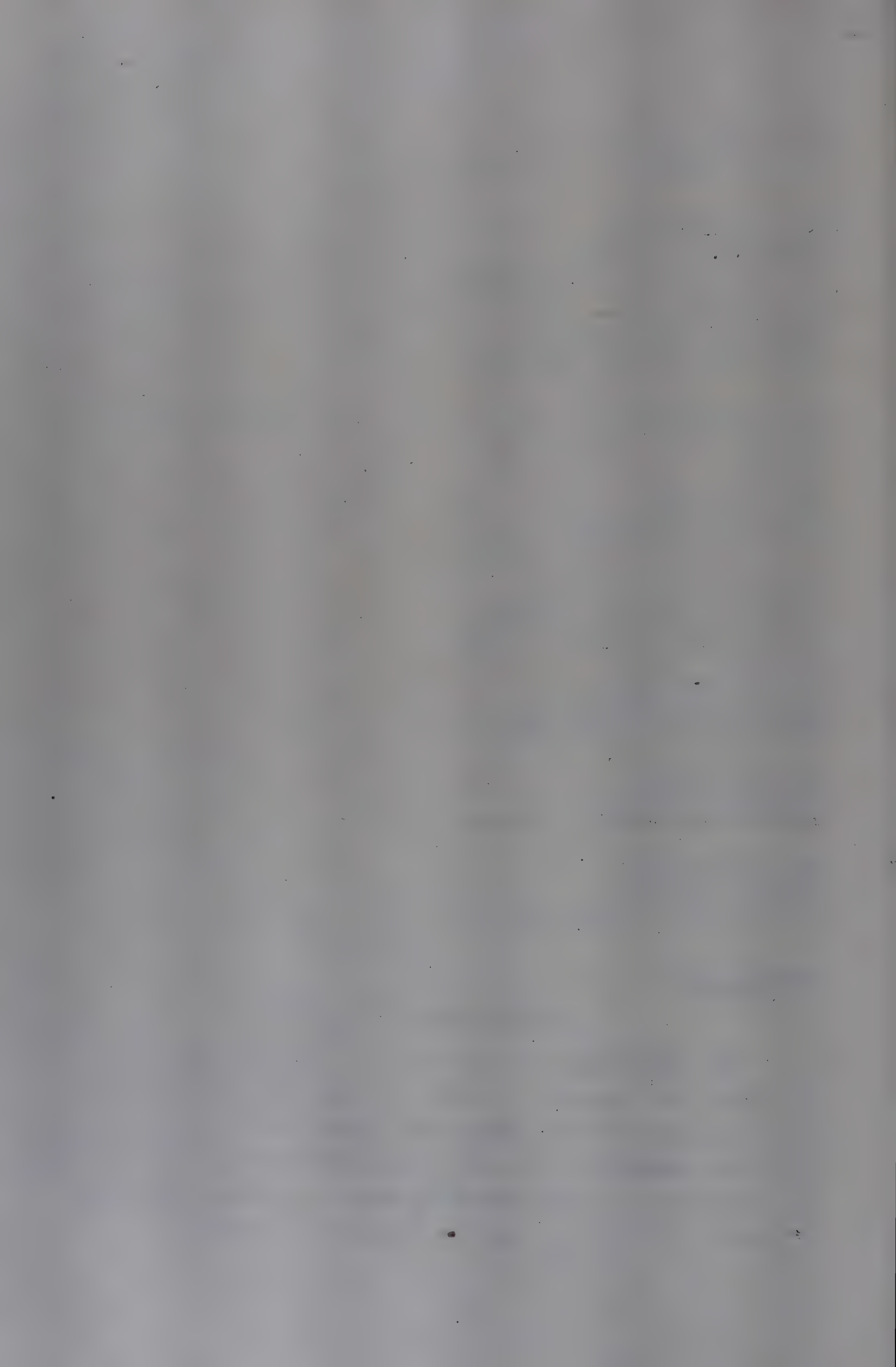
Shri G. Gopalan,
Section Officer,
CSIR Madras Complex, Madras.

"

ITEM No. 1:

Opening remarks by DGSIR

Dr. Nayudamma, in his opening remarks, spelt out the goals and charter of CSIR. He observed that projects will be judged by the impact they make on society and hence the focus ~~should~~ be on man. He referred to the criticism that one often heard about the CSIR that it spends large sums of money and does not make a commensurate impact on



industry or society. He attributed such criticism partly to the communication gap that exists between the CSIR and the public at large. He stressed the need for selecting projects which will make a solid, clear, and visible impact. The pattern of administration that needs to be introduced should be modern, decentralized, and internalized with authority delegated down the line. He also emphasized the need for coupling responsibility with authority so that those who are assigned certain tasks can deliver the goods. Good management has to be based on trust, and decisions have to be taken by discussion so that there will be a sense of involvement and commitment on the part of all concerned. All these things need the development of a new culture which senior men who are used to a different system have to be broken into.

Tracing the history of the CSIR Madras Complex, the Director General said that the idea was conceived by Dr. Zaheer and later nurtured by Dr. Atma Ram. The Complex, he said, offers a unique opportunity for developing a multi-disciplinary culture. He asked the Directors to speak their mind freely and frankly so that the Complex can be moulded to play a worthy role as part of the CSIR.

ITEM No. 2:

Report on progress achieved so far -
by Prof. G.S.Ramaswamy

Prof. Ramaswamy, welcoming the Director General, the Directors/their representatives, and heads of participating units, gave a brief account of the progress achieved so far. He said that the campus is very favourably situated on 25 hectares of land in close proximity to many other technological institutions. The buildings on the campus

were unique in that they incorporate the findings of research on full-scale to motivate engineers and architects in the area to adopt them in their own works. The complex has been so planned, that while it symbolizes unity, each of the buildings housed on the campus is so planned that their expansion is possible without hindering the development of the other units. He also said that, with the requests for more space from some of the participating units and other laboratories, a saturation point will soon be reached unless new structures proposed on the campus are designed as high-rise buildings. One of the advantages of locating several regional units on the campus has been that labour-sharing has been possible; for instance, MERADO is providing workshop facilities to all and the CSIO unit not only repairs and maintenance but is also helping other units in designing special instruments for their use. Similarly, the SER(R)C, apart from assuming the responsibility for the planning and construction of the civil works on the campus, will also in future provide computing facilities to all. With the help of financial assistance from the National Buildings Organisation, a building for housing the Computer facilities is already under construction. On behalf of all the units, Prof. Ramaswamy requested the Director General to favourably consider allotting funds for the installation of a tele-link for commuting with the 370 computer expected to be installed at the IIT Campus in July. The work of the SERC is completely computer-oriented and the CSIR Complex being a major user, a courier system will not be satisfactory as the distance, by road, between the CSIR Complex and the IIT is 7 km. Moreover, SERC is engaged in development of new soft-ware and the courier system will inhibit the work of scientists engaged in this type of activity. Prof. Ramaswamy also observed that at a number of meetings of the Coordinating

Committee, heads of units have been pressing him to constitute stores as a common service so that a common Stores Officer can relieve scientists of administrative chores connected with stores. The arrangement envisaged is that, while the Stores Officer will be common and the stores staff in the units will be under his administrative control, the stores will be stacked in the respective units themselves for convenience. The Stores Officer will always consult the heads of units if any of the valuable stores held by them are to be issued to other units.

ITEM No. 3:

Report by Directors on the scope and functions of their regional units, Five Year Plan proposals of their units, and the strength and composition of their units during the Fifth Plan

The Chairman then invited the Directors to express their views and mention any problems that have come to their notice.

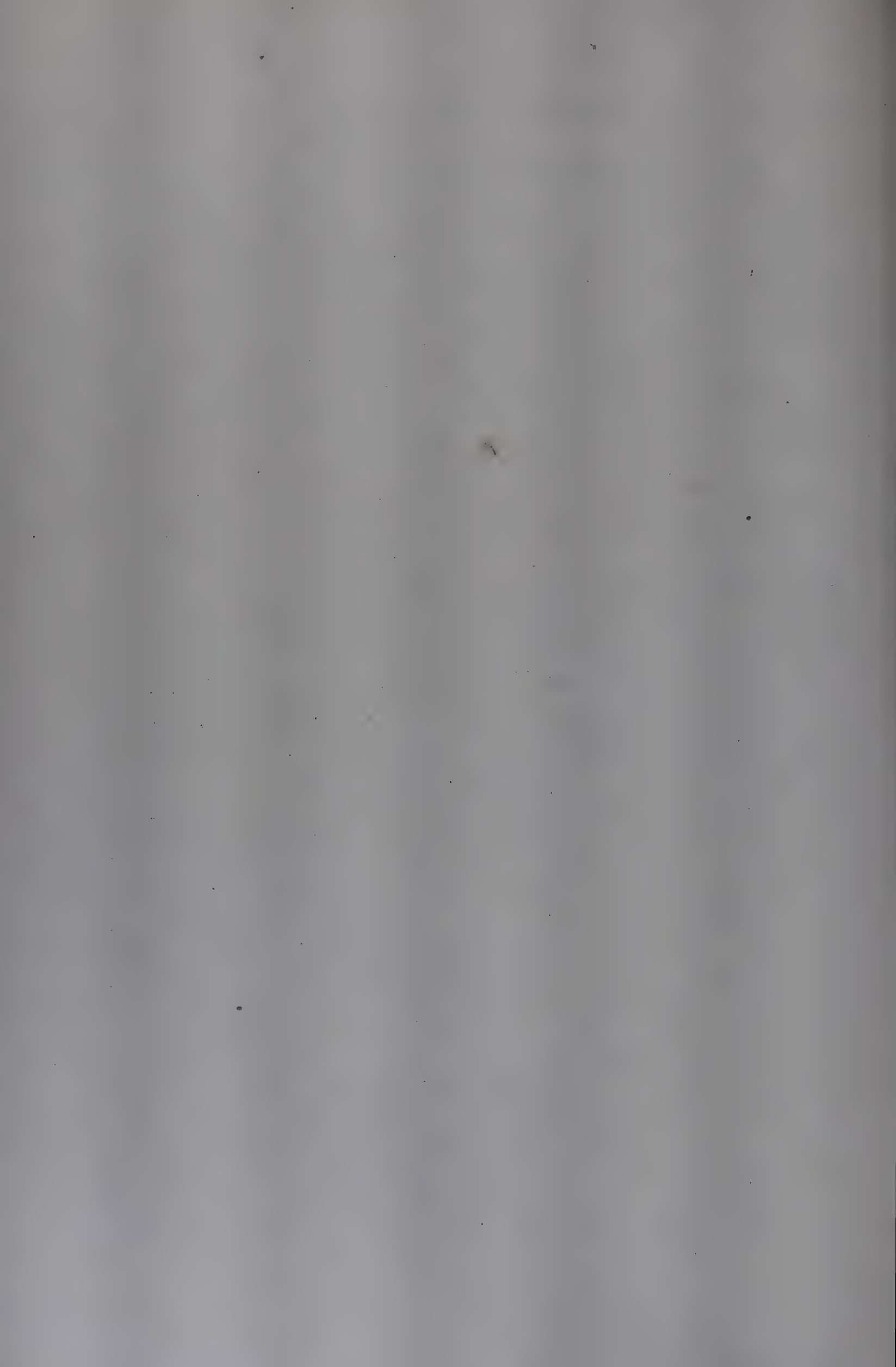
(i) Dr. Harsh Vardhan, Director, CSIO, observed that his unit was mainly concerned with service and maintenance and incidentally with any research that may be generated by these activities. He was of the view that his unit may spend about 25% of its time in handling R & D activities. He wondered if the centralization of the administration in the complex was not in fact contrary to the trend towards decentralization in the CSIR. Besides stores, his units at Madras and Delhi will also hold stocks of components. In view of this, he had no objection to stores being centralized under a common Stores Officer provided the stores can be held in the units themselves. He also said that ^{it} is not practicable to up-grade the post of Scientist-in-Charge at Madras because of the need to maintain parity with other



Service & Maintenance Centres elsewhere.

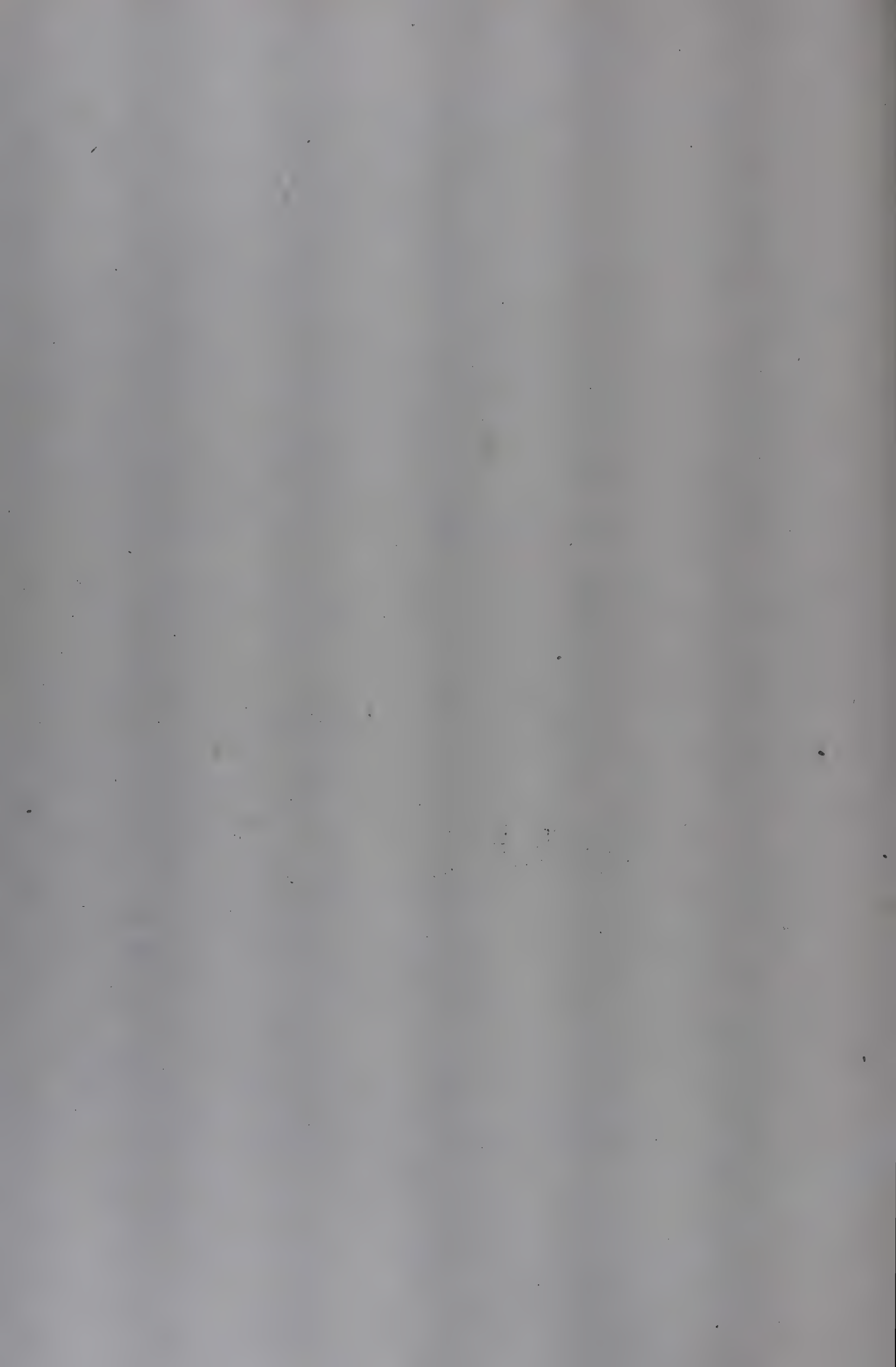
(ii) Prof. Majumder stated that his unit was mainly concerned with problems of regional importance and he looked at the CPHERI Zonal Centre as essentially an extension unit for propagating the technological know-how developed at the headquarters. He wondered whether these functions will be disrupted under the new set-up proposed in the working paper. He was also apprehensive that each unit will drift away from their headquarters if more and more projects are planned locally at the CSIR Complex.

(iii) The Director General intervening asked Dr. Majumdar whether there was any other alternative. Dr. Majumdar in his reply observed that the units may be located on one campus but remain independent. The Director General said that there are many advantages if administrative services are shared by all the units located on the campus. Good management, he added, should not involve accountability to many masters. However, accountability to two masters in the complex set-up is inevitable and should be accepted. The loyalty to the Co-ordinator and loyalty to the Director of the parent laboratory are a must. The Complex projects need to be dove-tailed into the needs of the State and the region. The Complex need to be aware of the Five Year Plans of the States. In turn, the Complex also should provide information to the States in the region about what the Complex can do for them. If this new experiment is to work successfully, the participating units must, to some extent, subserve their own individual interests without losing their identity. Guidelines now framed for working can be changed later on in the light of experience. Rigidity is not desirable and pragmatism must characterize our approach. The Director General stressed the need for heads of units stationed at



Madras being given adequate powers to match their responsibilities. They should be required to approach their Directors only in such instances where the normal rules cannot be followed. In his view, the Complex should function as a poly-technological clinic much in the same manner as a poly-medical clinic. The Complex has potentialities to function in this manner and we should not deny to ourselves the advantages inherent in this set up. To achieve these goals, active canvassing and even concealed compulsion may be necessary in the initial stages until all concerned are broken into this new culture. The Director General clarified that this should not in any way mean the rupturing of the linkages between the units and their parent laboratories.

(iv) Dr. Chatterjee of the NML, speaking next, said that an Ore Dressing and a Refractories Unit will be located on the Complex. Considering the volume of work that the NML unit will be called upon to handle in future because of the three new steel plants that are proposed to be set up in South India, Dr. Chatterjee said that there was not much in common between his unit and the other units except CECRI and he, therefore, wondered how his unit can interact on the others. He also endorsed the view of Dr. Harsh Vardhan that while a common Stores Officer may control and coordinate Stores activities in the campus, the stores may be stacked in the units themselves. He was also of the view that the relationship between NML scientists stationed at Madras and the Co-ordinator on the one hand and between them and the Director, NML on the other should be made clear to avoid conflicts in future. He supported the need for a strong information and liaison base to enable the Complex to function effectively.



(v) Dr. Udupa, Director, CECRI, tracing the history of his unit, observed that it was initially meant to contact markets at Madras for supplies for the headquarters at Karaikudi. Even today, it is visualized as an extension unit. It acts as a show window for the processes developed at the headquarters and, in this respect, it has done well and six processes developed at Karaikudi have been licensed to industry at Madras. It feeds back information from industry to the headquarters and serves industry by issuing questionnaires to ascertain their needs. At this stage, the Director General intervened to ask the Director to spell out his present thinking about the scope and function of his unit. Dr. Udupa clarified that his unit also undertakes problems of minor trouble-shooting nature with the limited facilities available at Madras. It had also demonstration units based on processes developed at the headquarters. The Director also observed that his Executive Council was not in favour of transferring any major activities from the headquarters to Madras. During the Fifth Five Year Plan period, he said, the regional unit will have a strength of 40 and the investment expected to be made will be in the order of Rs.30 to 40 lakhs. Dr. Udupa said that bio-electric research which is not pursued at the headquarters will be carried out at the regional unit in close collaboration with the medical profession and the bio-engineering department of IIT, Madras and the CSIO. This proposal will be placed before the Executive Council for its approval. Dr. Udupa said that, of late, he has been experiencing some difficulty in procuring supplies for Karaikudi through the regional unit.

(vi) Shri A.Chakravarty, representing Dr. De, said that during the 3 years of his stay at the Complex, he has been very much benefitted by being relieved of administrative

(x) Shri Vittal Rao of CIPHERI Zonal Centre said that the headquarters should also be consulted before any unit became involved in inter-disciplinary projects.

(xi) Director General intervened at this stage to observe that he found there was no formal linkage between the CSIR Complex and the CLRI. Considering that both belong to CSIR, such linkages are desirable.

(xii) Shri U.H.Narayanan, of the CSIO wondered whether units located on the campus should charge each other for services rendered. The Director General observed that charging each other is not a bad thing because it helped in costing projects properly.

(xiii) Shri Narayanan thought that the status of the Scientist-in-Charge mattered and those with higher status were accorded preferential treatment. On being asked whether he had any specific problem in this regard, Shri Narayanan said that he had sometimes problems in getting transport. The Accounts Officer, intervening, clarified that the guidelines issued for vehicles did not discriminate between heads of units on the basis of their rank.

(xiv) Shri Ramaiah observed that such minor local problems need to be sorted out in a spirit of give and take. He also referred to the objections received from the two Directors when the CSIR sought to give adequate powers to Scientists-in-Charge stationed at Madras. Shri Ramaiah also remarked that if the Directors have any reservation about giving these powers to the heads of units now stationed at Madras, they may think of upgrading the posts of Scientists-in-Charge so that more powers can be delegated.

(xv) Dr. N.V.Parthasarathy observed that he was not able to appreciate the view that research should be accorded the last priority making the Regional unit function largely as an Extension Centre. The Director General observed that this is a problem that should be taken up by the Director CECRI with the Executive Council to find a solution.

(xvi) The Accounts Officer remarked that Shri Sood's position in the Complex should be defined as he is senior to the Officer-in-Charge of the CSIO unit. The Director General suggested that the Co-ordinator may sanction Shri Sood's tour programmes.

(xvii) The Administrative Officer explained that all heads of units were treated alike and the administration did not discriminate between heads of units on the basis of their rank.

(xviii) At this stage, Prof. Ramaswamy provided the following clarifications. He explained that the proposal made is that a common Stores Officer will coordinate the work of the Stores staff located in the various units who will function under his administrative control. However, for the sake of convenience, the stores belonging to the various units will be stacked in the units themselves and will remain independent.

Referring to Dr. Udupa's remark that he had some difficulty in making purchases for his headquarters, Prof. Ramaswamy observed that he was not aware until recently that the CECRI unit at Madras is making purchases for Karaikudi. He was informed by Dr. Parthasarathy recently that he was making the purchases himself without utilizing the purchase machinery on the campus. If Dr. Udupa would let him know the amount of work to be handled, he will be in a position to examine whether the Complex Purchase Officer

will be able to handle this work with some strengthening of his staff.

The Coordinator also clarified that the guidelines relating to transport were framed in consultation with the Co-ordinating Committee. He also reported that since Shri Sood took over the responsibility of maintaining vehicles, there were fewer breakdowns and the number of road-worthy vehicles has increased, easing the transport problems to some extent.

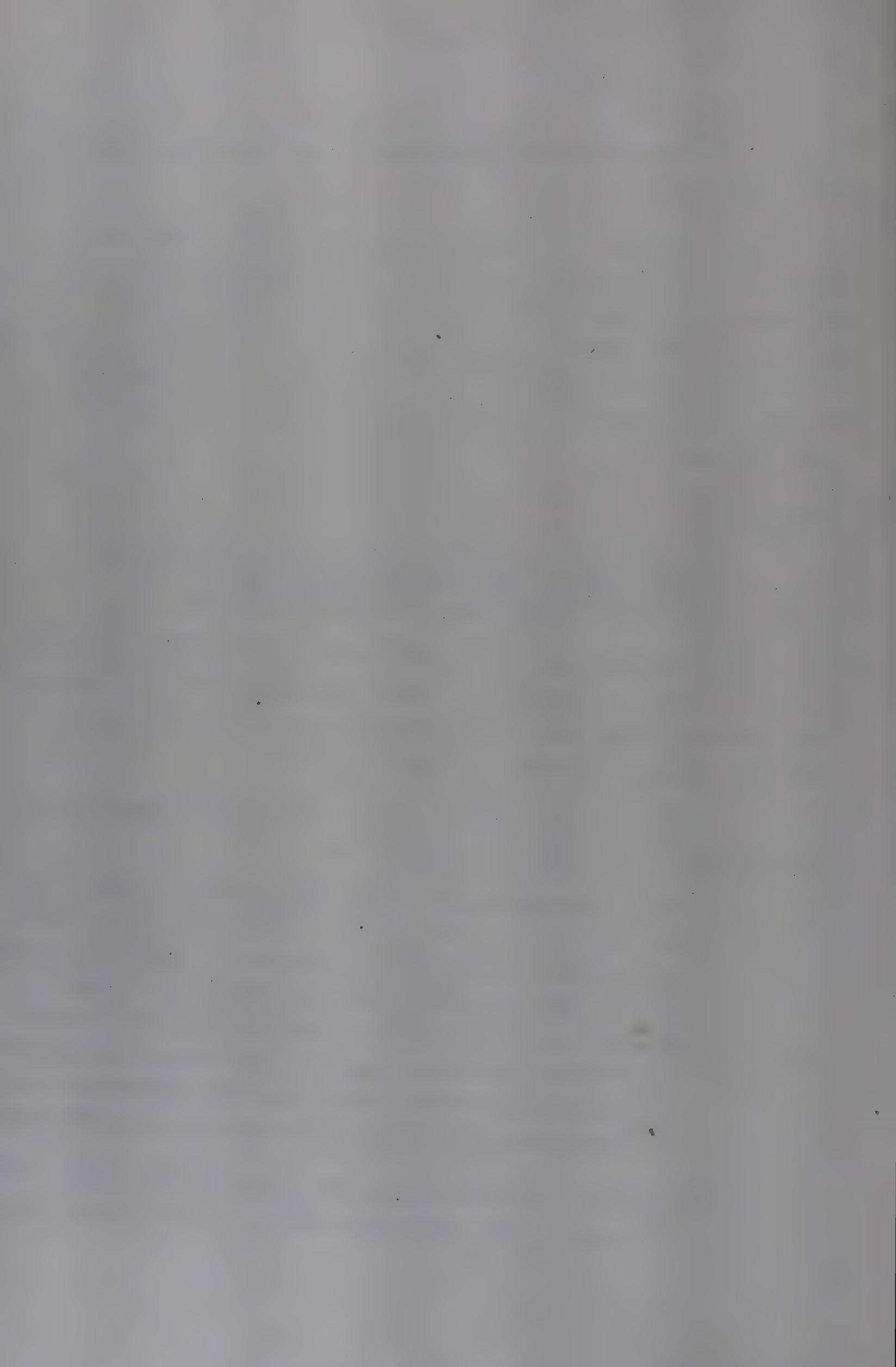
ITEM No. 4:

Working paper on Scope, Role, Goals, and future development of CSIR Madras Complex by Prof. G.S.Ramaswamy - Discussion thereon

The working paper prepared by Prof. Ramaswamy was next taken up for consideration. Prof. Ramaswamy briefly presented the paper. Based on the discussions on the working paper, the following consensus emerged:

4.1. The Regional units located on the CSIR Complex will be engaged in two types of activities.

- (a) Projects/activities which they pursue on their own in line with the functions assigned to them, be it extension, service and maintenance, design, or research. ~~These~~ projects which are undertaken by the units themselves without the collaboration of the other units will be pursued with the guidance and direction of the headquarters. Funds for such activities will be found from the budgets of their parent laboratories.
- (b) Inter-laboratory or multi-laboratory projects, with or without the participation by industry, for which



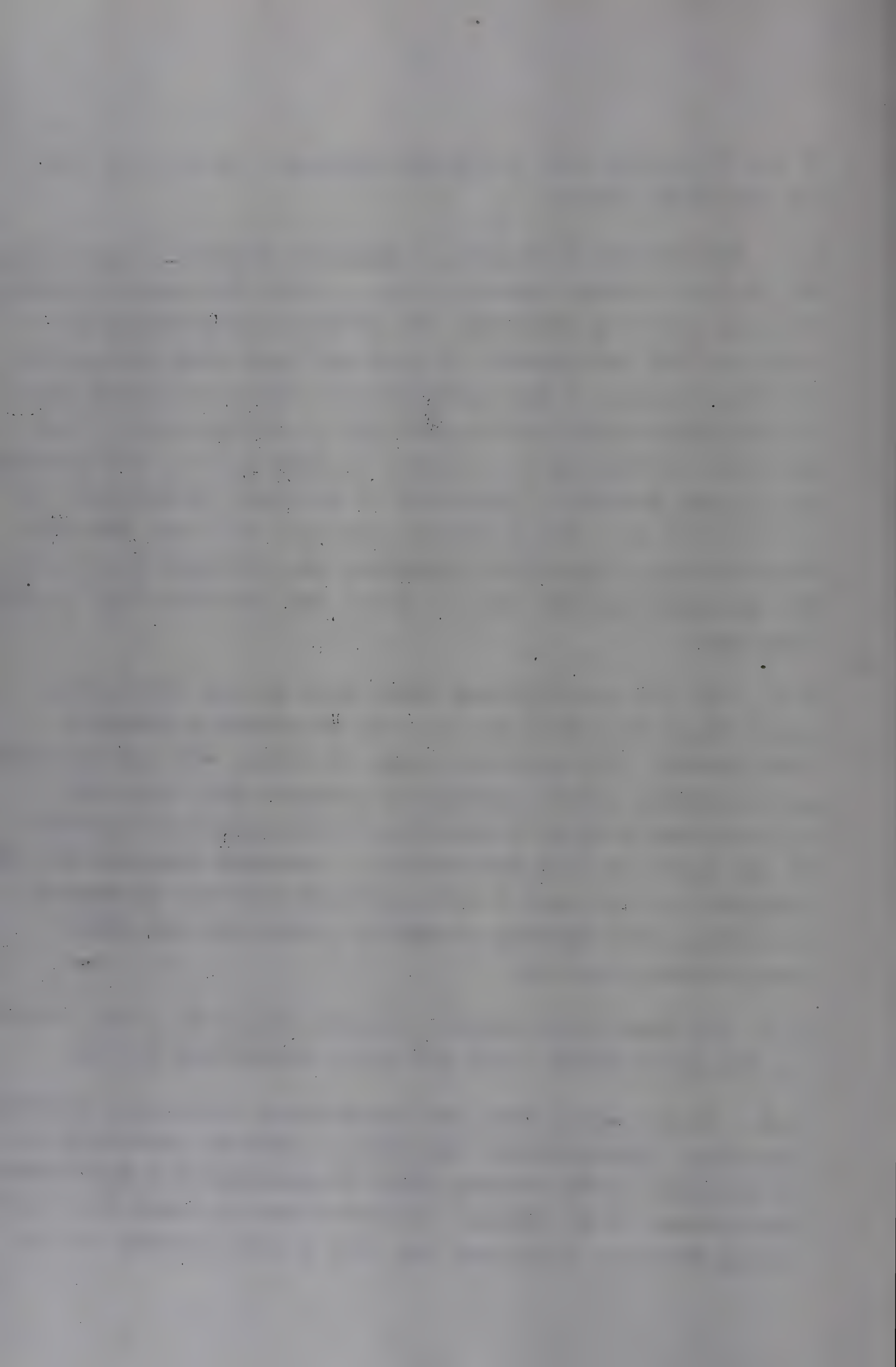
decisions will be locally taken by the Project Leaders in consultation with the Coordinator. The parent laboratory will be consulted before any of the units decide to participate in such inter-laboratory or multi-laboratory activities. Directors will also be kept informed of the progress of such projects. The Project Leaders who are appointed to coordinate inter-laboratory or multi-laboratory projects will be given powers to match the responsibility that they are called upon to shoulder.

4.2. The Complex will prepare a research programme which will list both kinds of projects.

4.3. Certain guidelines for inter-laboratory and multi-laboratory projects suggested in the working paper were slightly modified as a result of discussion and were approved. These are given in the Appendix.

4.4. The Complex will function as a polytechnological clinic and the Co-ordinator will function more as a Dean than as a Director. His role is to coordinate the activities of the various units located on the Campus. He will act as a link between the Complex and industry and help in attracting projects to the Complex. He will also assist in analysing the projects so received and form inter-laboratory and multi-laboratory teams for handling them. He will also synthesize the results achieved and sell them to industry. The Complex will be known by the reputation of its specialists in different disciplines.

4.5. It was agreed that the Complex may have an Advisory Committee with representatives drawn from industry and educational and research institutions in the region. The functions



posts which are immediately required. The DG also observed that while he agreed that there was need for the post of Scientist B for industrial liaison work, it was not proper to link it with any individual however suitable he might be.

4.10. The executive oriented administrative structure proposed in the working paper was agreed to. The DG, however, remarked that this concept of executive-oriented administration was not adequately reflected in the pattern of administrative staff asked for.

ITEM No. 5:

Fifth Five Year Plan proposals of the
Complex-consideration of

The draft Fifth Five Year Plan proposals for the Complex were briefly discussed. It was agreed that the Co-ordinator may pursue it further with the CSIR.

ITEM No. 6:

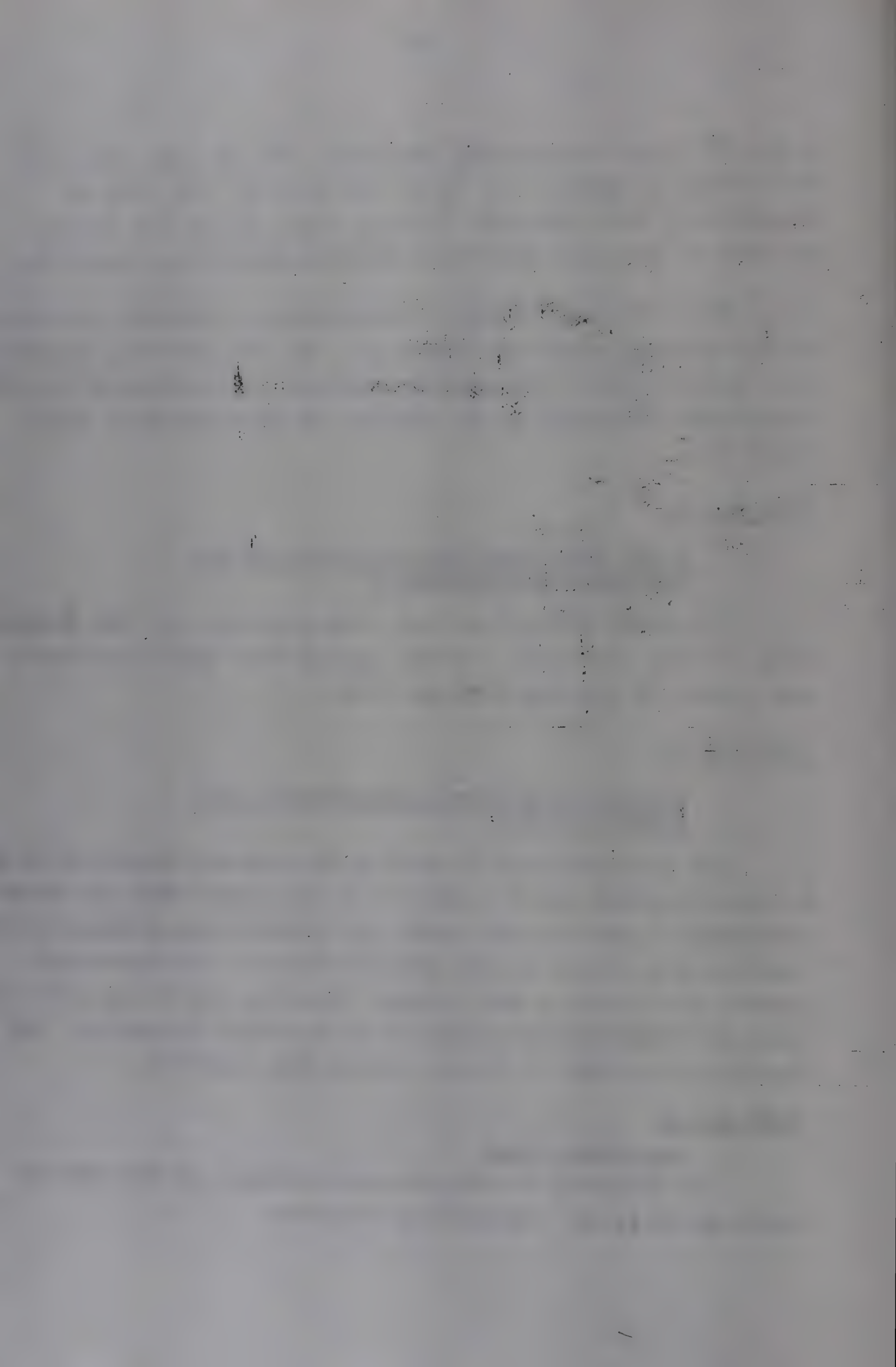
Setting up a Stores Organisation as a
Common Service

The item relating to setting up a Stores Organisation as a Common Service was discussed. It was agreed that the stores personnel in the various units may be under the administrative control of a common Stores Officer who will coordinate all stores activities on the Campus. However, the Stores will be held and financed independently by the units themselves. The creation of a post of Stores Officer was approved.

ITEM No. 7:

Any other item:

(i) Declaring the Scientists-in-Charge of the various units as their own Controlling officers.



The proposal to declare the Scientists-in-Charge of the various units as their own Controlling Officers and to sanction their own tours was approved. Air travel will, however, be sanctioned by the Directors in the case of those Scientists-in-Charge who are not otherwise entitled to travel by air.

The meeting terminated with a vote of thanks to the Chair.

SUMMARY OF DECISIONS TAKEN

1. Formation of Advisory Committee and Executive Committee (Vide paras 4.5 and 4.6)

The Complex will have an Executive Committee patterned of the model of what is now envisaged for the National Laboratories. There will also be an Advisory Committee. The functions of this Committee will be advisory without any executive powers.

2. Preparation of Research Programme and Annual Plan for the Complex as a whole (vide paras 4.2 and 4.7)

The Headquarters Laboratory shall supply the data to the Scientists-in-Charge of the participating units who in turn will pass on the information to the Co-ordinator for preparing research programme of the Complex for inter-laboratory and multi-laboratory projects.

3. Inclusion of provision for inter-laboratory projects in the budget estimates of Common Services and role of Co-ordinator (vide paras 4.3 and 4.4)

Guidelines for Inter-laboratory and multi-laboratory projects were approved. The Co-ordinator will coordinate the activities of the various units in the campus and act as a link between Complex and the Industry.

4. Formation of Information area and creation of essential posts required immediately (vide para 4.9)

The formation of an Information, Industrial Liaison, Publicity, Publications and Public Relations unit was approved and the Coordinating Director was asked by the DG to take up the matter with the CSIR for the creation of the posts which are immediately needed.

5. Streamlining the Administrative machinery and executive-oriented administrative structure (vide para 4.10)

The Executive-oriented administrative structure was approved.

6. Setting up of Stores Organisation (vide para 6)

The setting up of a Stores Organisation as a Common Service and the creation of a post of Stores Officer were approved.

7. Declaring the Scientists-in-Charge of the participating units to be their own controlling officers and Co-ordinator as Controlling Officer for Shri M.P.Sood, Scientist. (vide paras 7(a) and 3(xvi)).

The proposal was approved. It was also decided that the Co-ordinator may sanction tour programmes of Shri M.P. Sood, Scientist 'E', CSIO Centre.

APPENDIX

GUIDE-LINES FOR HANDLING MULTI-DISCIPLINARY PROJECTS
OFFERED BY INDUSTRY

1. Inter-disciplinary projects from industry may be attracted to the Complex either at the initiative of the Coordinator or of the individual units.
2. The Coordinator may be brought into the picture as soon as any of the units make the initial contacts.
3. The Coordinator will convene a meeting of the heads of the units to discuss the project. As a result of the discussions, an inter-disciplinary team will be named with a Project Leader drawn from the major discipline involved.
4. The Project Leader will be responsible for the coordination and progress of the project. He will also be responsible for all trouble-shooting. Adequate powers will be delegated to him for the management of the project.
5. All decisions relating to inter-disciplinary projects will be taken locally by the Project Leader and the Coordinator, and the parent laboratories involved kept informed.
6. Where projects are fully financed by industry, the funds received will be credited under the Complex account and the expenditure on the project will be met therefrom. The expenditure will be sanctioned by the Project Leader/Coordinator.
7. If projects are fully financed by industry, the amount collected from the industry for the project may include, apart from the cost of the project and overheads, an appropriate fee. The fee so received from industry will be distributed between CSIR and investigators in accordance with rules.

It is essential that such incentives are offered to scientists to give industrial-orientation to the research and development activities of the Complex and to foster and promote multi-laboratory cooperation.

8. In the case of projects which are only partially financed by outside agencies, CSIR's contribution will be provided for in the Complex budget. Such projects need to be anticipated at the time budget proposals are framed or in the revised estimates.

9. Each inter- or multi-laboratory project will be assisted by an Expert Committee consisting of the Project Leader, one or more members of the project team, and one or two representatives drawn from the industry sponsoring the project.

APPENDIX IX

Proposals for new Extension Centres/
Divisions of the National Laboratories
under the V Five Year Plan

ALL INFORMATION CONTAINED
HEREIN IS UNCLASSIFIED
DATE 10-10-2001 BY 60322 UCBAW

APPENDIX IXPHYSICAL & EARTH SCIENCES GROUP

Indicated financial
input during Fifth
Five Year Plan
(Rs. in lakhs)

National Physical Laboratory

Field Station for Radio Science	210
Computer Centre	28*

Central Scientific Instruments Organisation

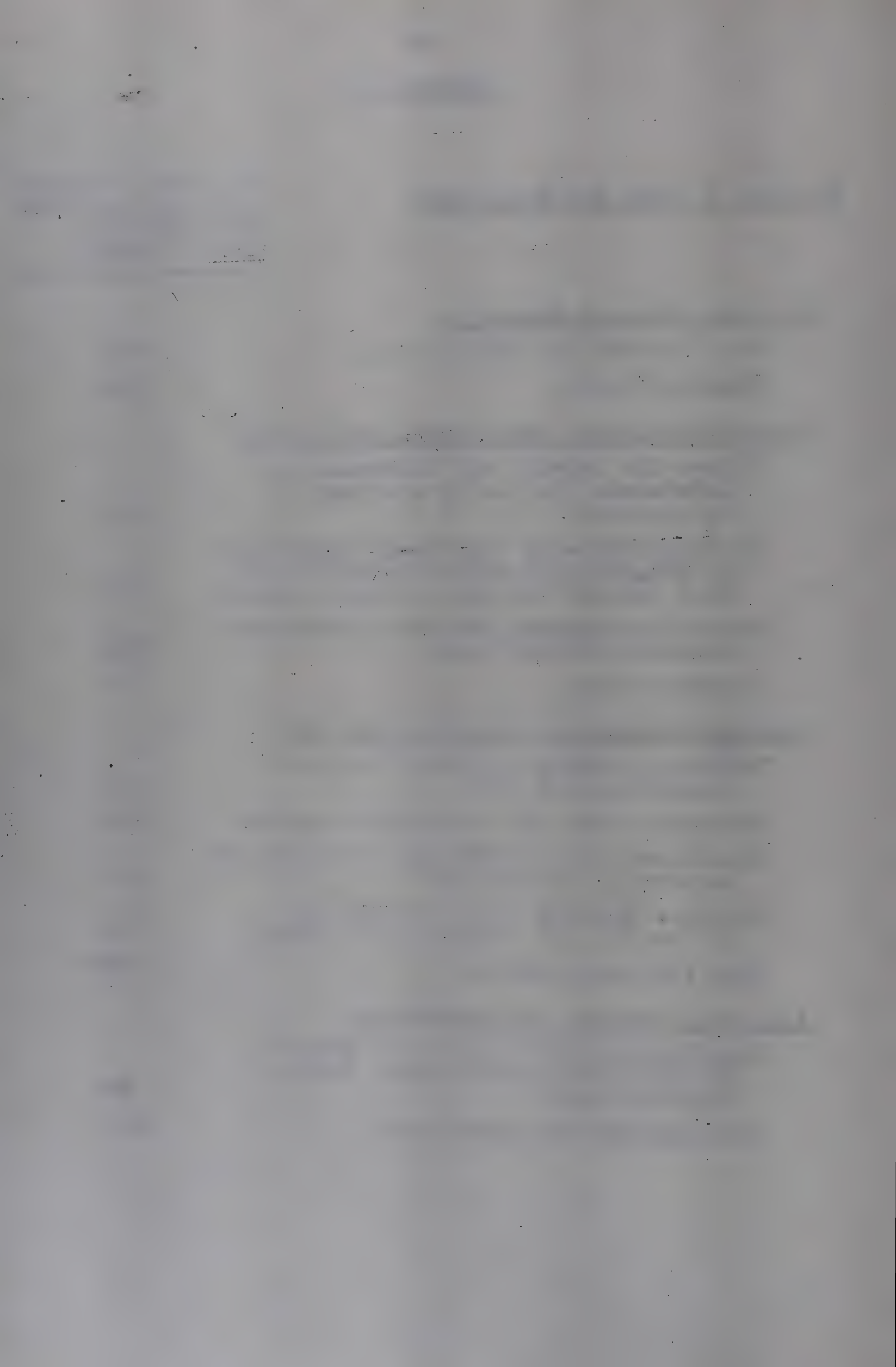
Centres for Service and Maintenance of Instruments (including training of technicians)	210
Training Precision Instrument Technicians in Industrial Electronics and Die and Mould Making (one year advanced course)	61
Centre for Training Precision Instrument Mechanics in the South	103
Computer Centre	71

National Geophysical Research Institute

Airborne Geophysical Survey Facility - a subsidiary of NGRI	45
Subsidiary Unit for Groundwater Surveys	50
Subsidiary Unit of NGRI for production of Geophysical Instruments	25
Regional Research Centre of NGRI at (a) Bhopal, (b) Jaipur and (c) Patna	75
Data Processing System	20**

National Institute of Oceanography

Organisation & Development of Indian National Oceanographic Data Centre - Computer based	58*
Oceanographic Research Vessel	242



(Rs. in lakhs)

CHEMICAL SCIENCES GROUPNational Chemical Laboratory

Chemical Engineering Research Centre	182
Computer Centre	56*

Central Electrochemical Research Institute

Tropical Corrosion Testing Station, Mandapam	12
Setting up of Extension/Demonstration Centre at Calcutta & Bombay	20

Regional Research Laboratory, Hyderabad

Centre for Advanced Research in Cellular & Molecular Biology	83
Computer Centre	121*

Regional Research Laboratory, Jorhat

Sub-Stations in the States of	
(a) Nagaland; (b) Meghalaya;	
(c) Tripura; (d) Manipur; and	
(e) Arunachal Pradesh	26
Computer Centre TDC-12	15*

ENGINEERING SCIENCES GROUPCentral Building Research Institute

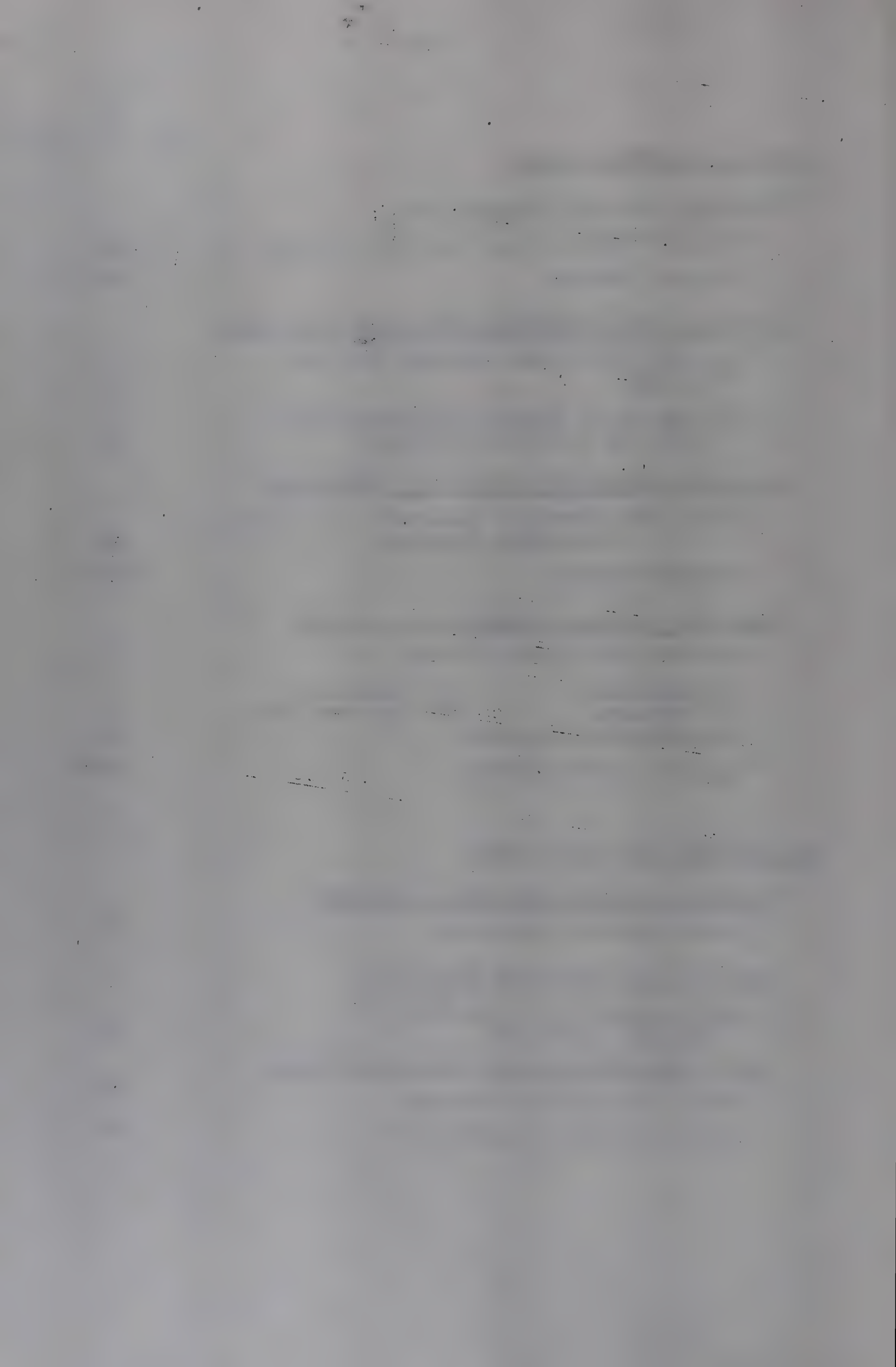
Rural Building Division	15
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Central Road Research Institute

Establishment of four Regional Research Stations	48
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Structural Engineering Research Centre

Model Analysis Laboratory	11
Computer Centre at Roorkee	41*



(Rs. in lakhs)

National Aeronautical Laboratory

Information Centre for Aeronautics	68
Regional Computer Centre	460 (including (f.e. of 166.4 from UNDP)
Turbomachinery & Combustion Laboratory	170 (including (f.e. of 60.44 from UNDP)
Material Science and Technology Research Centre	350

Central Mechanical Engineering Research
Institute

New Merados/Estension Centres in Kerala, Gujarat, Uttar Pradesh and Rajasthan	113
Consultancy Division and Engineering Design Centre	114
Computer Centre	15*

National Metallurgical Laboratory

Establishing of Corrosion Servicing and Testing facilities	15
Establishment of facilities for R & D of High Temperature Electrochemical processes	28
Establishment of large scale hydro- cum-electrometallurgical Testing facilities	283
Large scale sponge iron testing facilities	182

Central Glass & Ceramic Research
Institute

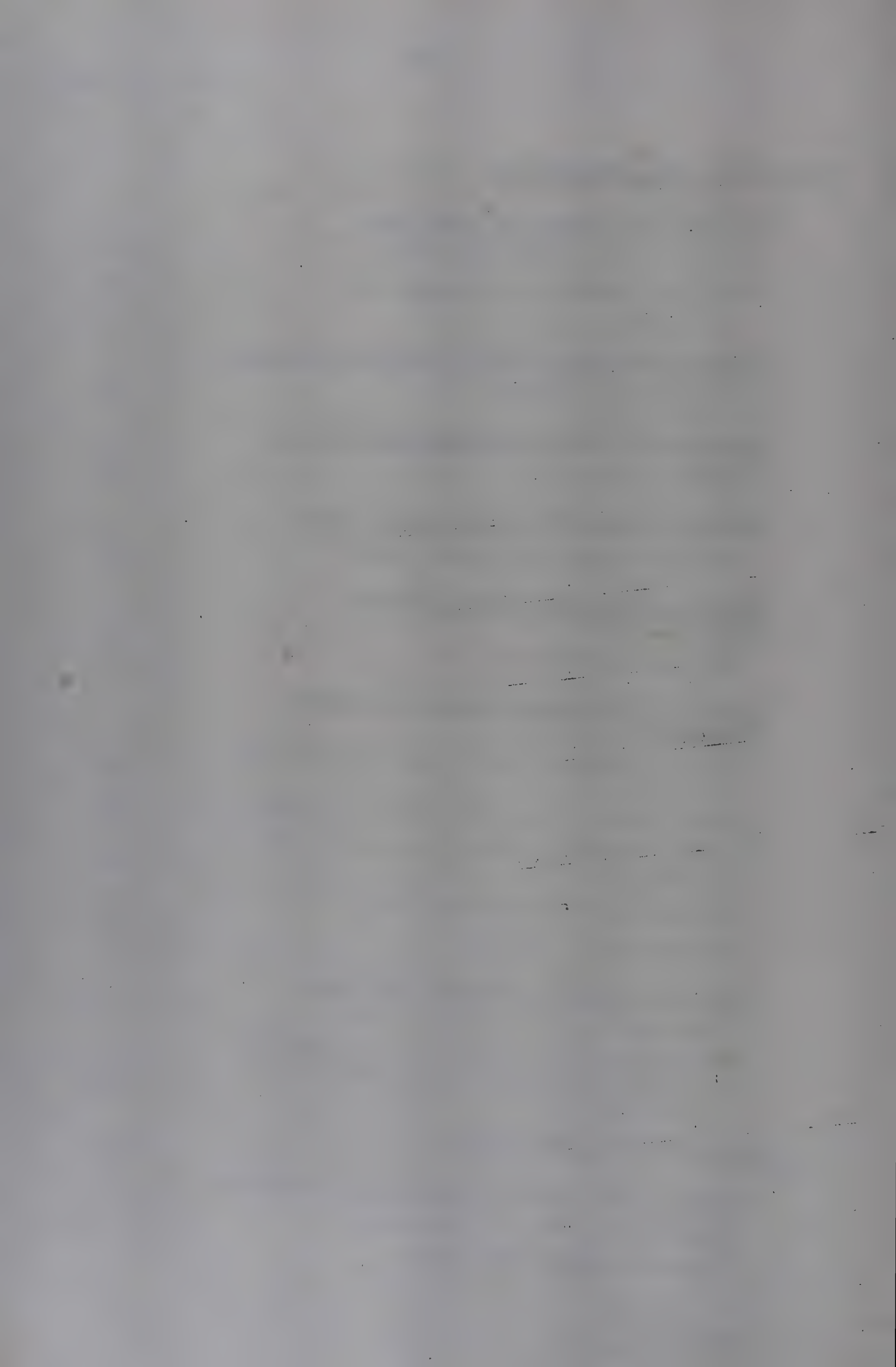
Extension Centre in the South	20
Extension Centre in Maharashtra	24

BIOLOGICAL SCIENCES GROUP

<u>Central Drug Research Institute</u>	
Fermentation Technology Unit	72
Regional Centre for Analytical Services	55
<u>Indian Institute of Experimental Medicine</u>	
Biophysics Division	15
<u>Industrial Toxicology Research Centre</u>	
Field Centres	72
<u>Regional Research Laboratory, Jammu</u>	
Field Station in Kangra Valley	18
<u>Central Indian Medicinal Plants Organisation</u>	
Extension Centres- (2)	50
<u>Central Food Technological Research Institute</u>	
Food Science & Technology Information Centre	48
R & D Centre for Enology and Brewing	123
Establishment of Milling and Baking School	114
Fermentation Technology Unit	22
Experimental Stations	118
<u>Central Leather Research Institute</u>	
International Training Centre	80
Industrial and Technical Information Centre including Data Bank for Leathers	12

INFORMATION SCIENCES GROUP

<u>Birla Industrial & Technological Museum</u>	
Additional Museum Galleries	55
Central Exhibition Unit	17



(Rs. in lakhs)

Visvesvaraya Industrial & Technological Museum

Additional galleries 10

Industrial and Technological Museum at Bombay 103Industrial and Technological Museum at Delhi 103
(Or other location)Indian National Scientific Documentation Centre

National Science Library 225

National Science Press 271

National Technological Information System 458
(includes computer facility costing 100 lakhs)Publications & Information Directorate

Photocomposing Unit (To be integrated with National Science Press as and when set up) 21

Total	{ Other Programmes }	51,85
	{ Computers }	5,25

* Subject to approval by Department of Electronics

** Linked with proposal of Computer Centre at RRL (Hyderabad).

APPENDIX X

New Proposals of Institutional Nature
under the V Five Year Plan

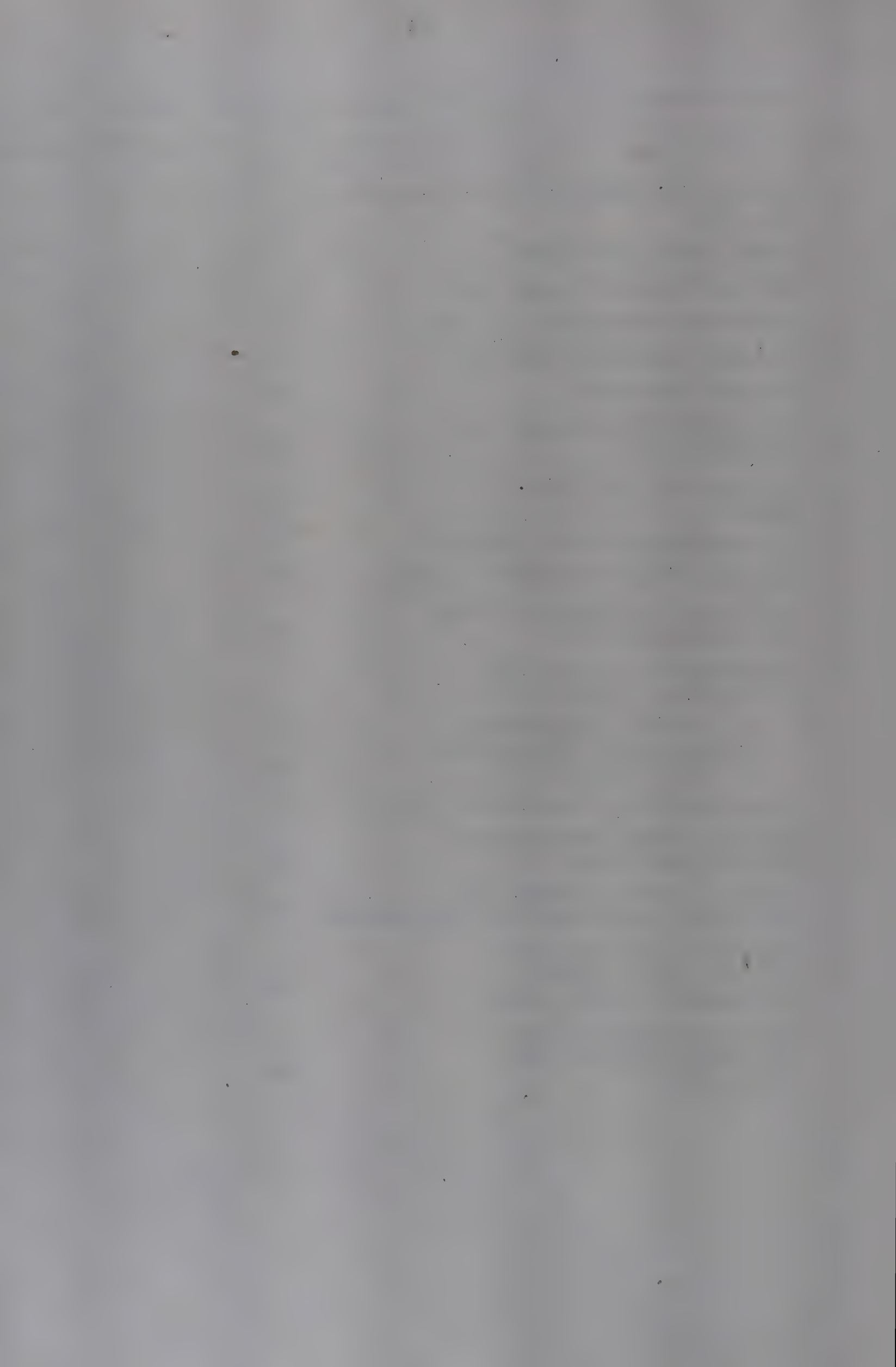
APPENDIX X

CSIR's Fifth Five Year Plan (Table 9) has listed the following proposals for establishing new Centres for R & D

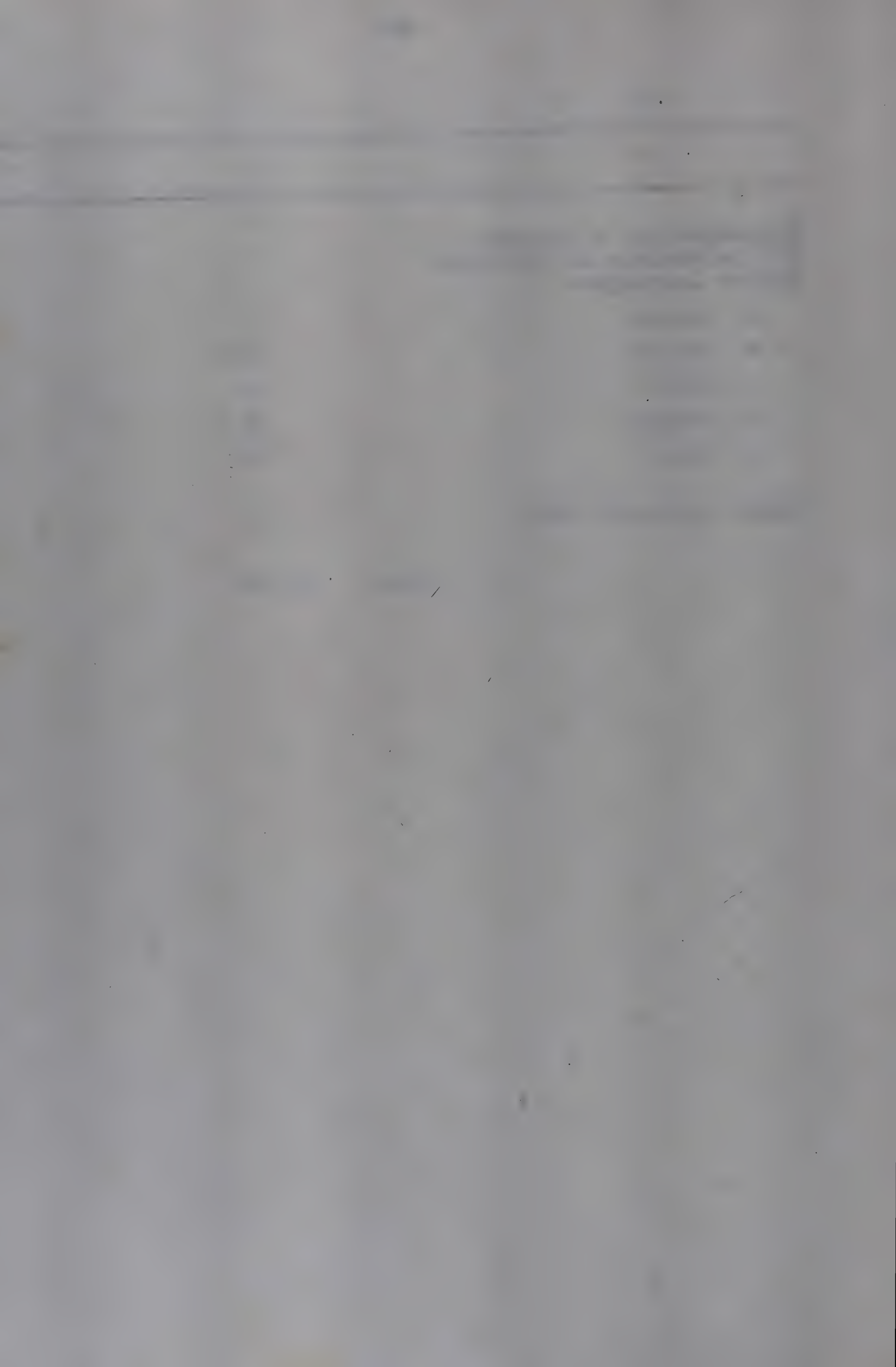
(Rs. in lakhs)

Title	Financial inputs	Remarks
1	2	3
Central Research Institute for Paper and Pulp Technology	42	To be set up as RA o 50:50 basis
Regional Research Laboratories/ CSIR Complexes/Polytechnological clinics in		
a) Bihar	378	State Governments wi be required to share expenditure for spec projects of interest to the States
b) Kerala		
c) Gujarat		
d) Madhya Pradesh		
e) Punjab		
f) Rajasthan		
g) Uttar Pradesh		
h) West Bengal		
Institute for Fermentation Research and Engineering	42	
Institute for Refrigeration and Air-conditioning	42	To be set up as RA o a 50:50 basis
Corrosion Research	63	
Electrical Research and Development Organization	42	To be set up as RA o a 50:50 basis
Fibre Research Laboratory	42	To be set up as RA o a 50:50 basis
Institute for Tyre Research	42	
Fly Ash Research	30	
Institute for Agricultural and Agro Engineering Machinery	42	
Centre for Training of Laboratory Technicians (Physical and Biological)	42	

1	2	3
Centres for Catalyst Research	63	
Solar Energy Research	21	
Central Marine Design Orgn.	100	
Aluminium Institute of India	42	
Welding Research Institute	42	
Polymer Research	42	
Research & Development of Refractories	42	
Research on New Types of Engines	72	
Biological Research Centres	63	
Optical Glass Research Centre	75	
National Non-ferrous Metals Research Institute	80	
Engineering Design and Consultancy Centres for:		
a) Chemical Engineering	42	
b) Mechanical Engineering	42	
c) Civil Engineering	42	
International Consultancy Bureau	42	
Science based Industries/ Industrial Parks	50	
Nucleus for the Study of Science, Technology and Development	12	
Technical Information Bureau for various Industries in the Labs.	150	
Regional Centres for Testing & Analytical Facilities	84	



1	2	3
Dissemination of Science and Technology in following Indian Languages:		
a) Bengali	15	
b) Marathi	15	
c) Tamil	15	
d) Telugu	15	
e) Urdu	15	
Market Research Cell	12	
Total		20,00



APPENDIX XI

Interm Recommendations

APPENDIX XI

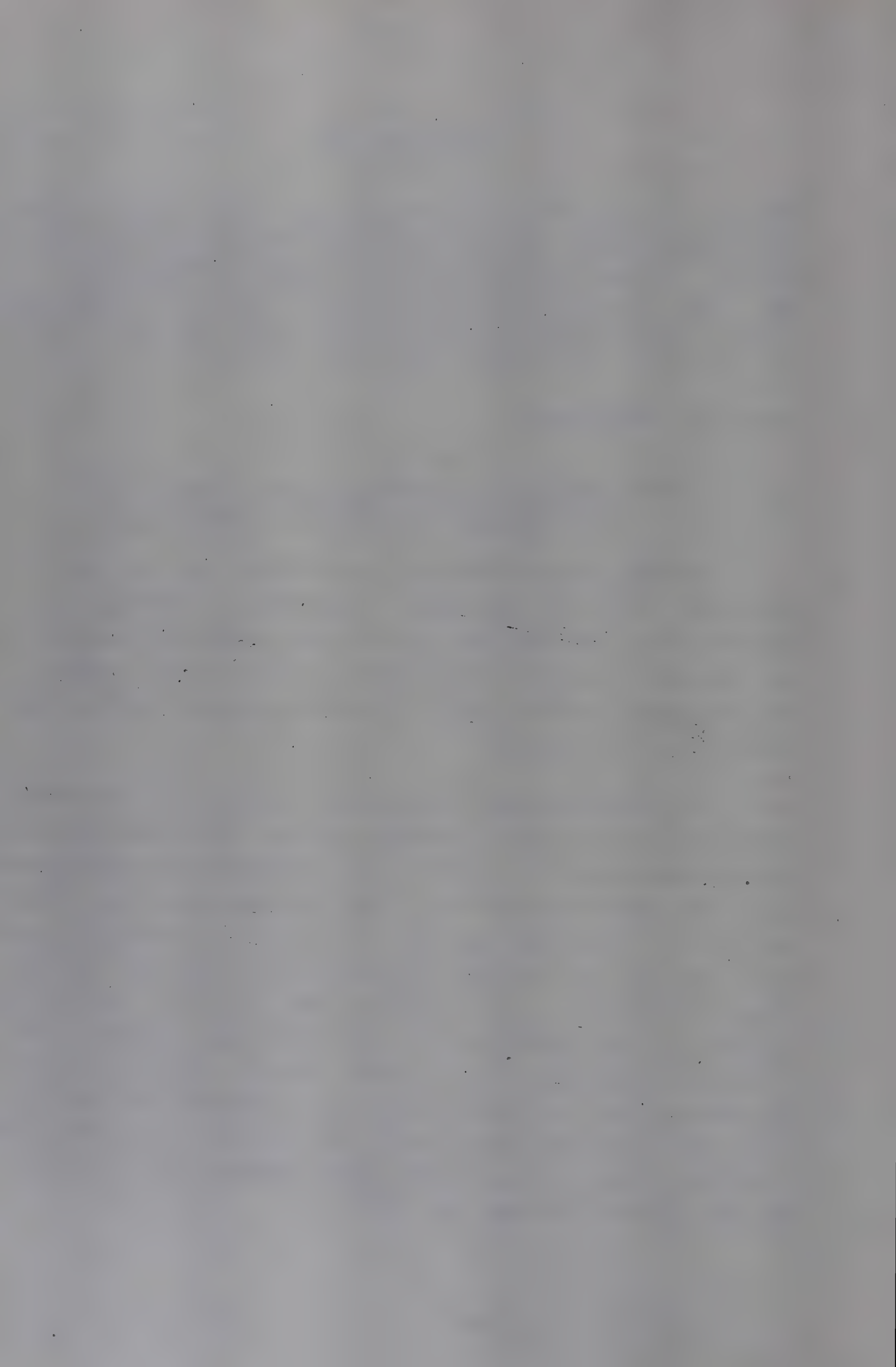
Copy of the D.O.Letter No.T.617.6/4067, dated 15th Feb.1974, from Dr.G.S.Sidhu, Director, Regional Research Laboratory, Hyderabad-500009, addressed to Prof. Y.Nayudamma, Director-General, Council of Scientific and Industrial Research, Rafi Marg, New Delhi-110001 and copies endorsed to Shri Baldev Singh, Chief, Technology Utilisation, CSIR, New Delhi, and Dr. B.L.Amla, Acting Director, CFTRI, Mysore.

Dear Prof. Nayudamma,

Sub: Interim recommendations on setting up of
R & D Centres in different states.

Through your D.O.Letter No.DG(PS)/73.354 of 23rd February, 1973, you had kindly constituted a committee, Dr. B.L.Amla, Shri Bharat Bhushan and myself, to examine the requests received from various states to set up RRLs and to advise on the nature of assistance which CSIR could provide in this regard.

2. The Committee has studied the existing and projected extension activity of different national laboratories, located in various states in form of zonal laboratories, experimental stations, field centres etc. The Committee has also considered whether the existing gaps can be filled in by setting up multi-disciplinary multi-purpose laboratories as desired by the State Governments. We are now in the process of writing our report. In the meanwhile, we feel necessary to make a few interim recommendations to enable advance action on these. In making these recommendations, the committee has kept in view the guidelines approved by the Vice-President, CSIR and conveyed to us by Shri Baldev Singh through his D.O.letter No.8/2/72-L of February 26, 1973.



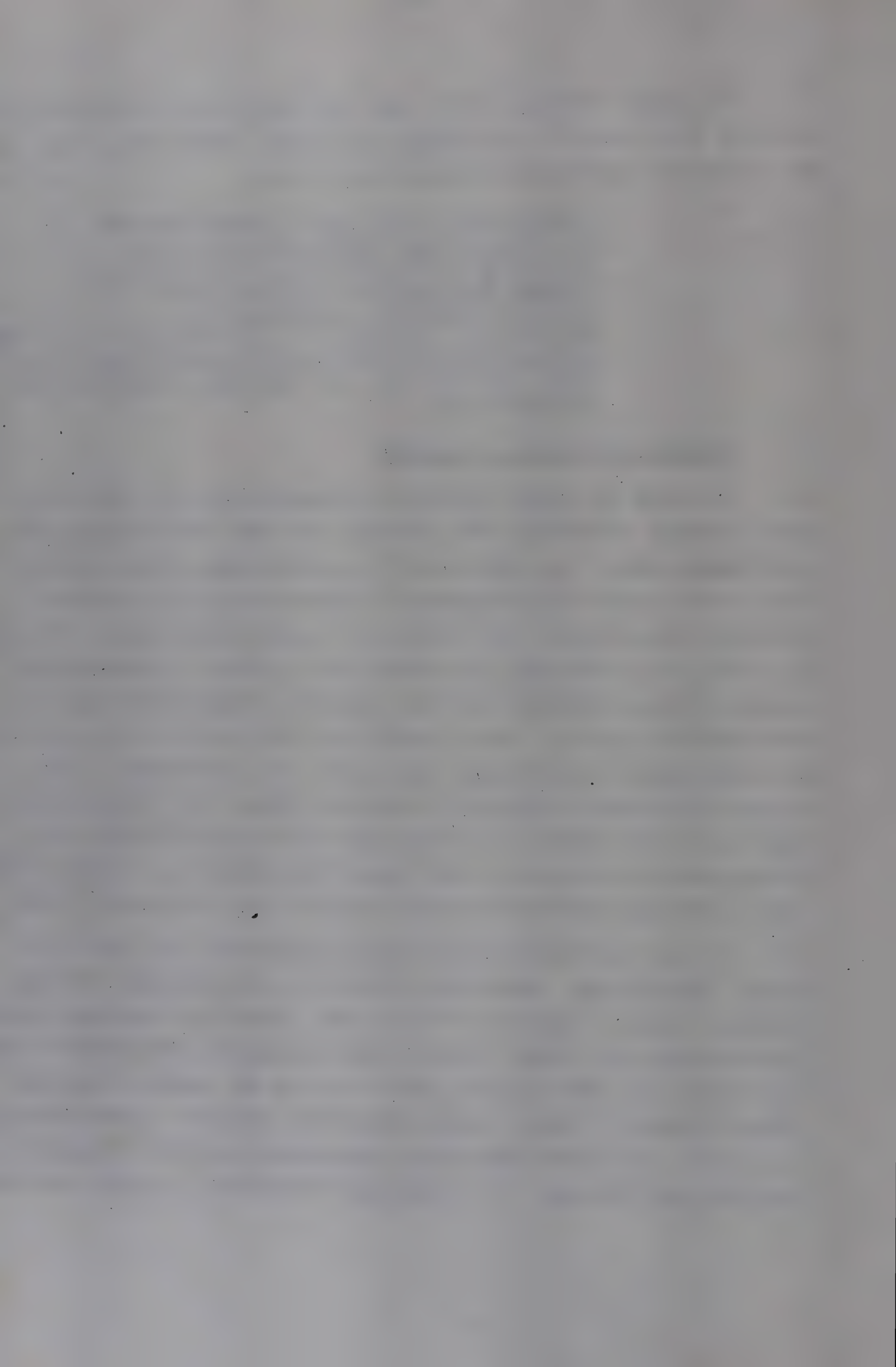
3. The gaps between R & D and its application throughout the country which need to be filled are many. Those requiring urgent and immediate attention however relate to:

information, liaison and coordination,
 analytical and testing facilities,
 upscaling or downscaling facilities,
 design and engineering assistance,
 general technical consultancy,
 projection of needs of a given region into R&D
 integration of state and national plans with
 R&D, and the role of CSIR HQ in planning and
 coordination.

4. Polytechnological clinics:

4.1. Setting up these clinics is considered to be the first and the most important step towards closing the several gaps mentioned above. As stated in the guidelines, these clinics are in the nature of diagnostic, information and direction centres for group of industries in a particular area. If area is taken as a boundary of a state or a group of states, the scope of these clinics will be slightly widened but may be necessary to do so. Their capability of these centres will be to understand the problems and direct the concerned to the source of solution within or outside CSIR. The clinics will thus also necessarily serve as information collection and dissemination centres having links with industry, state government, national laboratories and other R & D centres and CSIR, HQ.

4.2. It is recommended that these polyclinics be set up at Patna, Chandigarh, Ahmedabad, Bangalore, Trivandrum, Bhopal, Bombay, Jaipur, Lucknow and Calcutta. The four Regional Research Laboratories at Jorhat, Jammu (and Srinagar), Bhubaneswar and Hyderabad and CSIR Complex at Madras may be asked to set up these clinics to serve their respective states. Jorhat Laboratory will also serve Meghalaya, Arunachal Pradesh, Nagaland, Manipur and Mizoram. If considered necessary, a centre may be



established at Imphal. Likewise, Chandigarh clinic will cater for Chandigarh, Punjab, Haryana and Himachal Pradesh.

4.3. Considering the important role of these clinics, care should be taken from the beginning to staff these properly and adequately. Perhaps, a little scouting within the national laboratories will be useful. Scientists who have inclination and aptitude towards the required activity could be identified and chosen.

4.4. The following staff is tentatively suggested for each clinic:

Scientist F ..	1
Scientist E ...	5
Documentation Officer	1
Documentation Assistant	3
Filing Assistant	1
Accounts Assistant	1
Stenos (Pool)	4
Housekeeping staff	3
	<hr/>
	19
	<hr/>

It is visualised that each scientist will represent different broad area of specialisation.

4.5. It is estimated that each clinic will have approximately Rs.4 lakhs as its annual budget and will need an office accommodation of 4000 ft.².

5. Service Centres

5.1. These centres are visualised as extension centres of specialised laboratories and will be designed to perform only service activity very little of R & D. Examples of these are: NML Field Centres; CLRI Field and Extension Centres; Service wing of MERADO; CSIO Centres; Analytical wing of CPHERI; consultancy and advisory activity of CBRI, CRRI and SERC; demonstration, advisory activity and some R & D by CFTRI and CIMPO; etc. It is further visualised that these service centres will be carefully



planned and established in different parts of the country taking into account the need of the region, existing facilities, agro-climatic peculiarities and future possibilities..

5.2. As far as possible, these centres will have a group of service activities on the same campus. For example, MERADO, NML and CSIO; CBRI, SERC, CIPHERI and CRRI; NCL, CFTRI, CIMPO, CLRI and CECRI etc.

5.3. To begin with service centres should be planned for the states of Gujarat, Haryana, Kerala, Madhya Pradesh, Punjab and Rajasthan. It is, therefore, suggested that the concerned state governments may be approached to start a dialogue.

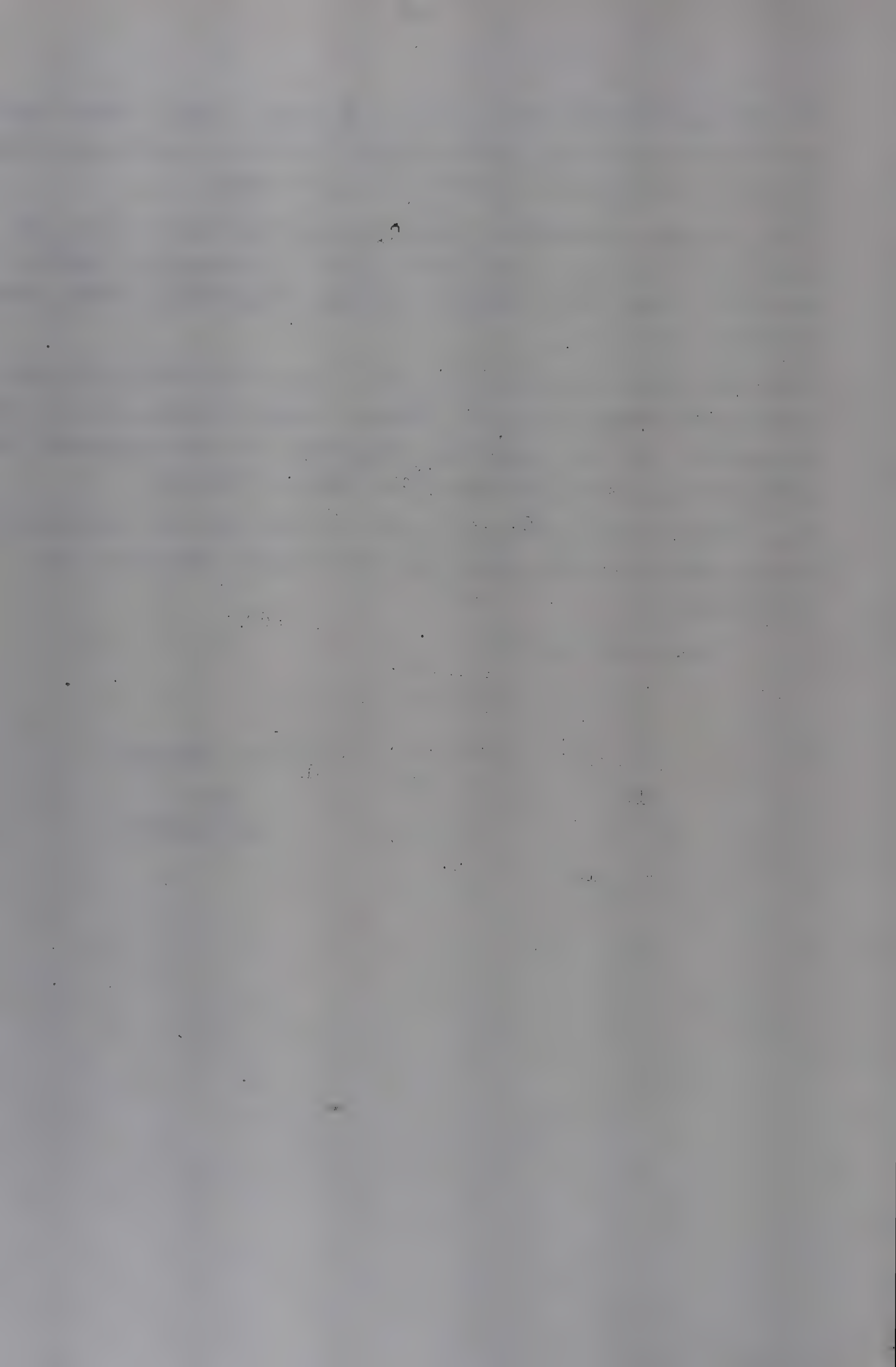
6. The Committee will present its views on the establishment of new RRLs or Centre based on CSIR complex, Madras in its final report.

With kind regards,

Yours sincerely,

Sd/-

(G.S.SIDHU)



APPENDIX XII

Regional Testing Laboratory in Punjab

APPENDIX XII

Copy of the D.O.Letter No.SCI-T-617.11, dated February 16, 1974 from Dr. G.S.Sidhu, Director, Regional Research Laboratory, Hyderabad-500009 addressed to Shri Baldev Singh, Chief, Technology Utilisation, Council of Scientific & Industrial Research, Rafi Marg, New Delhi.

Sub: Regional Testing and Development Laboratory
in Punjab.

My dear Baldev,

Kindly refer to your D.O.Letter No.26/12/73-L of 27th July, 1973 enclosing a copy of D.O.Letter IDW/IA/RTL/20974-C dated 18th July 1973 addressed to you by Shri S.S.Gill, Industrial Adviser, Directorate of Industries, Punjab, Chandigarh.

I have already written to DGSIR (and copy endorsed to you) conveying the interim recommendations of the Committee on setting up R & D centres in different states. In these recommendations, we have suggested inter alia that a Polytechnical clinic may be set up at Chandigarh to cater for the states of Punjab, Haryana and Himachal Pradesh and the Union Territory of Chandigarh. We have also suggested that a Service Centre may also be established in Punjab.

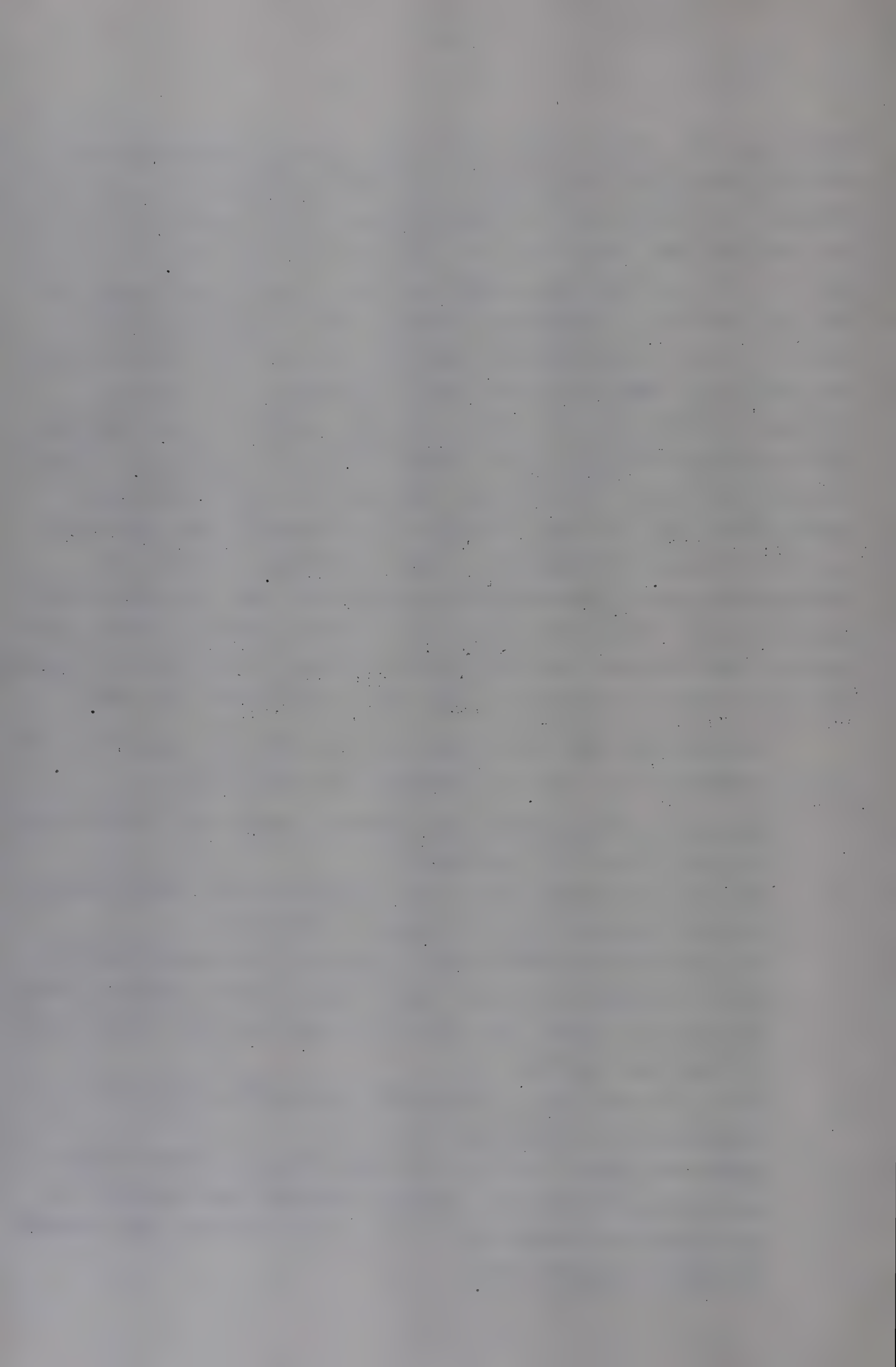
CSIR has four extension centres already functioning in this State. In addition, a national laboratory (CSIO) and a training centre (also at CSIO) are located at Chandigarh. The extension centres are: CFTRI, Experimental Station, Ludhiana; MERADO, Ludhiana; CLRI, Regional Extension Centre, Jullunder and NML, Field Station, Batala.

The locations of these centres were apparently chosen so as to be in the heart of the relevant industry. For example, NML Station is located in the Industrial Estate in the foundry town of Batala, CLRI Centre in campus of a tannery and MERADO in the textile and hosiery area. These locations have many

advantages but they suffer from lack of inter-disciplinary interactions with other centres of CSIR Laboratories. Leather industry in Punjab may be concentrated in and around Jullunder, but service and advice is not exclusive to this area. In fact, due to its very location, CLRI Centre is unable to extend its area of service. Jullunder industry can as well be served if the centre is located at Ludhiana and will in addition have the advice of MERADO Scientists and Engineers on problems falling in their field either directly or indirectly, through CLRI extension workers and a small office at Jullunder. This becomes even more evident when one examines the limitations under which NML Station at Batala has operated and yet built up a good image. During our visit to Batala, we had had discussions with individual industrialists and also with their Association. They were unanimous in their appreciation of the work of the Station but demanded additional facilities of testing and R & D which fall more in the field of MERADO than NML.

Considering the above factors and also the request of the State Government in view, we suggest the following:

1. Immediate steps should be taken to establish a Polytechnological Clinic at Chandigarh.
2. The existing four extension centres of the CSIR laboratories be located on one campus at Ludhiana.
3. The present CLRI Extension Centre at Jullunder and NML Field Station at Batala may be retained but only as small branches to serve the local industry on spot and as parts of Ludhiana set-up.
4. There is need for a CPHERI Centre which may also be established at Ludhiana.
5. CIMPO and RRL, Jammu may be requested to extend their activities in Punjab, Himachal Pradesh and Haryana for cultivation of medicinal and aromatic plants and extraction of active ingredients.



6. CSIR may also consider locating a laboratory with facilities for commercial chemical, physico-chemical and other sophisticated analysis in various parts of the country including one at Ludhiana.
7. In making the above recommendations, we also suggest that CSIR should insist on uniformity in appointing scientists who may head and staff these service centres. Scientist-in-Charge of a centre should not be less than a Scientist E. Also there should be adequate delegation of authority to the Scientist-in-Charge to undertake work and incur expenditure within the scope and the budget of the Centre.

CSIR may now initiate action and discuss the matter with the concerned State Governments.

With kind regards,

Yours sincerely,

Sd/-

(G.S.SIDHU)

1. The first part of the document is a letter from the President of the United States to the Congress, dated January 3, 1861. It is a very important document, as it contains the President's message to the Congress at the beginning of his first term.

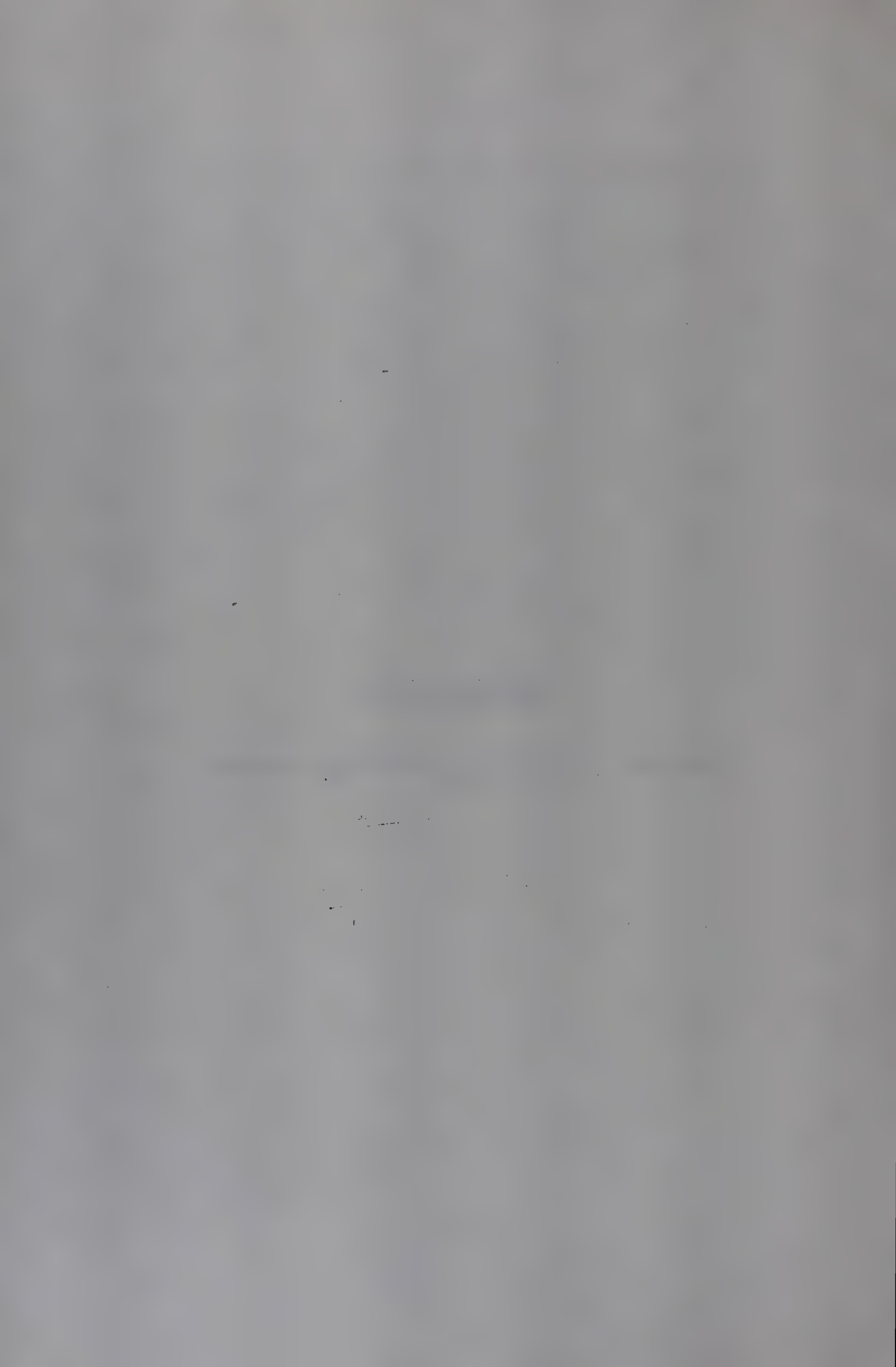
2. The second part of the document is a report from the Secretary of the Treasury, dated January 3, 1861. It contains information about the state of the Treasury and the financial condition of the country at the time.

3. The third part of the document is a report from the Secretary of the Interior, dated January 3, 1861. It contains information about the state of the Interior and the land policy of the government.

4. The fourth part of the document is a report from the Secretary of the Navy, dated January 3, 1861. It contains information about the state of the Navy and the naval policy of the government.

APPENDIX XIII

Itinerary of visits to extension centres



APPENDIX XIIIItinerary of visits to extension centres

<u>Date</u>	<u>Centre</u>	<u>Visited by</u>	<u>Discussions with</u>
19-6-1973	CPHERI, New Delhi	GSS BB	Shri A.K.Seth, Scientist-in-Charge and other senior Scientists
20-6-1973	RRL, Jammu	-do-	Dr.C.K.Atal, Scientist-in-Charge and other senior Scientists
	DRL, Jammu CIMPO, Jammu	-do-	Dr.Akhtar Husain, Scientist-in-Charge
21-6-1973	RRL (Ju), Srinagar Branch	-do-	Dr.C.K.Atal and Dr.B.K.Bhat
	DRL, Srinagar	-do-	Shri O.N.Channa, Scientist-in-Charge
22-6-1973	CIMPO Farm, Yarika	-do-	Shri Qureshi, Scientist-in-Charge
	CIMPO Farm, Manasbal	-do-	-do-
23-6-1973	Srinagar	-do-	Dr.M.Habibullah, Managing Director, J & K State Industrial Development Corporation Ltd., on the role of RRL(Ju) and CIMPO in the development of the State and related matters.
2-7-1973	MERADO, Poona	GSS BLA BB	Dr. S.K.Basu, Dy.Director and other senior Scientists
3-7-1973	NML, Ahmedabad	BLA BB	Shri R.N.P.Gupta, Field Officer
	CPHERI, Ahmedabad	-do-	Shri S.Rajagopalan, Scientist-in-Charge
	CBRI, Ahmedabad	-do-	Shri Y.K.Garg, Scientist-in-Charge

<u>Date</u>	<u>Centre</u>	<u>Visited by</u>	<u>Discussions with</u>
9-7-1973	CSIO, New Delhi	GSS BLA BB	Shri D.D.Puri, Scientist-in-Charge and Shri Agarwal, Scientist
10-7-1973	MERADO, Ludhiana	-do-	Shri Sarjit Singh, Scientist (Shri S.D.Garg, Scientist-in-Charge was away on leave)
	CFTRI, Ludhiana	-do-	Shri K.K.Mookerjee, Scientist-in-Charge and other Scientists
11-7-1973	CLRI, Jullunder	GSS BLA BB	Shri S.P.Ghosh, Scientist-in-Charge
	NML, Batala	-do-	Shri R.C.Arora, Field Officer, Shri O.P.Nagpal, Asst:Director, SISI, Shri R.C.Jain, STO, Quality Marketing Centre, Members of Chamber of Commerce
24-9-1973	CPHERI, Bombay	BB	Shri V.Raman, Scientist-in-Charge and other senior Scientists
26-9-1973	CSIR Complex, Madras	GSS BLA BB	Prof. G.S.Ramaswamy, Coordinating Director; Shri M.Ramaiah, Dy.Director, SER(R)C; Shri G.S. Subramanian, Scientist-in-Charge, CECRI Centre; Shri A.Chakravarty, Dy.Director, MERADO; Dr.Narayanan, Scientist-in-Charge, CSIO Centre; Shri Kishan Lal, Ad.O., CSIR Complex and other senior Scientists of various Centres.

